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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ADDRESSES AND ORIGINAL ARTICLES.

Prognosis of Prostatic Enlargement. By KENNETH WALKER, F.R.C.S. 1279

The Malnutrition Factor in Rheumatoid Arthritis. By F. D. HOWITT, M.R.C.P., and W. F. CHRISTIE, M.D.—(*Illustrated*) 1282

An Epidemic of the Bulbar Type of Poliomyelitis. By W. G. SCOTT BROWN, F.R.C.S.—(*Illustrated*) 1287

CLINICAL AND LABORATORY NOTES.

Gumma of Mediastinum. By H. F. JOYNT, M.B. . 1294

A Simple Face-screen. By Prof. KENELM H. DIGBY, F.R.C.S.—(*Illustrated*) . 1294

Atheroma in the Pulmonary Arteries. By G. ARBOUR STEPHENS, M.D. 1295

MEDICAL SOCIETIES.

Royal Society of Medicine: Sections of Neurology and Surgery: Acute Head Injuries 1295

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British Institute of Radiology: What is Radiation?—Radiation Treatment of Leukæmia 1299

REVIEWS AND NOTICES OF BOOKS.

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Gonorrhœa in the Male and Female. By P. S. Pelouze, M.D. 1303

Studies in the Photo-activity and Therapy of the Tungsten-Titanium Arc. By J. Burdon-Cooper, M.D., and Arthur Roberts, F.R.C.S. 1303

An Introduction to the Literature on Vertebrate Zoology. By Casey A. Wood, M.D. 1303

Arthur Conan Doyle. By Rev. J. Lamond 1304

"First Aid" to the Injured and Sick. By F. G. Warwick and A. L. Tunstall. Edited by F. C. Nichols, M.B... 1304

LEADING ARTICLES.

THE SPREAD OF POLIOMYELITIS 1305

STUFFINESS 1306

CHEMICAL CONSTITUTION OF THE VITAMINS 1307

ANNOTATIONS.

London School of Hygiene and Tropical Medicine. 1308

Hæmorrhagic Bright's Disease 1308

Suicide Statistics 1309

Medical Uses of Radium.. 1309

Burning Celluloid 1310

Resuscitation 1310

Induction of Labour by Medicinal Means 1311

Bacteriophage in Cholera 1311

The London (R.F.H.) School of Medicine Dinner 1312

OBITUARY.

Vincent Dormer Harris, F.R.C.P.—(*With Portrait*) 1326

Charles Albert Leedham-Green, F.R.C.S.—(*With Portrait*) 1326

NEW INVENTIONS.

Apparatus for Anæsthesia. By Ivor Lewis, M.R.C.S. —(*Illustrated*) 1304

SPECIAL ARTICLES.

General Medical Council: Penal Case: Alleged Canvassing 1313

Medicine and the Law: Needle Broken During Injection: Allegation of Negligence Fails.... 1318

The Lübeck Trial.—(*Continued*)..... 1319

Infectious Disease in England and Wales .. 1320

CORRESPONDENCE.

Contact Infection in Poliomyelitis (Mr. B. Whitchurch Howell) .. 1321

London Clinic and Nursing Home 1321

Cancer of the Cervix (Prof. F. J. Browne)..... 1321

Active Immunisation in Virus Diseases (Prof. Geo. H. Wooldridge).. 1322

Measles (Dr. Duncan Forbes) 1322

Research in Asthma (Dr. John Freeman) 1322

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Measurement of Deafness in School-children (Dr. Guy P. Crowden) 1324

Asphyxia Following Injection of Tartar Emetic (Dr. A. Fakhry) 1325

Anæsthetists in the Unit System 1325

PARLIAMENT.

Notes on Current Topics: Medicine in India.—Legislation Advanced.. 1327

House of Commons: The Means Test and Transitional Benefit.—The Calmette Vaccine.—International Labour Convention.—Conditions of Butter Production in Russia..... 1328

THE SERVICES.

Royal Naval Volunteer Reserve.—Royal Army Medical Corps.—Indian Medical Service.—Royal Air Force 1320

MEDICAL NEWS.

Society of Apothecaries of London 1329

University of Dublin.... 1329

University of Bristol ... 1330

Birmingham Hospitals Centre 1293

British Dental Hospital.. 1312

Italian Stomatological Society 1312

Progress of Middlesex Hospital 1320

University of Birmingham 1330

University of Durham... 1330

Royal College of Physicians of Edinburgh.... 1330

National Council of Nurses of Great Britain 1330

British Institute of Radiology..... 1330

Royal Faculty of Physicians and Surgeons of Glasgow 1330

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NOTES, COMMENTS, AND ABSTRACTS.

Surgery of the Urinary Organs: Sixty Years of Retrospect. By G. BUCKSTON BROWNE, F.R.C.S. 1332

"Duplex Therapy" 1333

Inquiries 1333

The Medical Directory for 1932 1334

The Arnold Triple Flow Suprapubic Urinal.—(*Illustrated*) 1334

More About Doctors' Wives 1334

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Medical Diary 1330

Vacancies 1331

Appointments 1334

Births, Marriages, Deaths 1334

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By Kenneth Walker, F.R.C.S. Eng.,

SURGEON IN CHARGE OF GENITO-URINARY DEPARTMENT, ROYAL NORTHERN HOSPITAL; SURGEON TO ST. PAUL'S HOSPITAL.

PROSTATIC enlargement is of importance chiefly because it commonly interferes with micturition. Where it does not do so it may cause very little inconvenience and have no effect on the patient's general health.

The first practical question is: What is the most likely course that an enlargement will take? Will the prostate continue to grow and interfere further with micturition, or is there any chance that the condition will remain in statu quo?

The answer to this question, so far as the enlarged and so-called adenomatous prostate is concerned, can be given with a large degree of certainty. Definite enlargement of the prostate is almost always progressive, but its rate of progress is not uniform. Over long periods the symptoms of enlargement may remain unaltered, and not infrequently the patient will enjoy interludes of actual improvement. I have had patients under my care whose condition over a period of five or six years has appeared to be stationary. They have risen once or twice at night to micturate, have noted a variable degree of difficulty in passing their urine, and on catheterisation have been found to have under 2 oz. of residual urine. Sometimes the symptoms are a little worse, sometimes a little better, the variation being due to such factors as the state of the bowels, indiscretions in diet, the weather, and fatigue. But when one reviews the history of these patients one finds that, if they survive the other dangers that encompass old age, in the long run their prostatic condition calls for active treatment. They are indeed like patients with a valvular lesion of the heart. For years the compensation is sufficient to their needs; but then there comes some new factor—an infection of the bladder, a congestion of the prostate, or a deterioration in the muscle tone of the bladder following an attack of influenza. The compensation breaks down, their symptoms become urgent, and active intervention is required. Often the accident that marks this crisis is a sudden attack of retention; more rarely it is recurrent hæmorrhage. But for one reason or another the outlook for these cases of mild obstruction becomes suddenly changed, and, willingly or unwillingly, they are driven to accept operative interference.

Postponement of Operation.

We must then ask: Is the medical man who has made the diagnosis of prostatic enlargement justified in waiting, or should he anticipate future trouble by insisting on surgical intervention even when the symptoms are trifling and the patient is put to little inconvenience? In other words, what is the prognosis of the expectant attitude and what is the prognosis attached to immediate operation? If the patient's prostate is definitely enlarged and almost certain sooner or later to need operative treatment, will an expectant attitude increase the risk when the evil day arrives? My own view is that it will not, or at any rate that the measure of increased risk due to waiting is so slight as to be justified, provided always that the patient is kept under constant observation and his residual urine and renal function carefully watched. On the other hand, is anything to be gained by waiting? Here again I would answer that in certain cases of elderly men there may be much to be gained by postponing drastic measures. It may be that, quite apart from the prostate, the expectation of life is only a few years. Why, therefore, should we reduce this expectation by insisting on a serious operation which after all he may never require? If he survives long enough for his prostate to give trouble, well and good; in the meantime let us give him the benefit of the doubt.

But what about the man of lesser age, with an expectation of ten or more years of life? Can we afford to wait in his case? Again I think we can, provided he be so situated that he can remain under careful scrutiny. A complete retention, if it is skilfully handled, does not materially increase the risk of subsequent prostatectomy, and a sudden and serious hæmorrhage with clot-retention is unlikely. Moreover there is a certain disadvantage in operating on a patient who suffers no inconveniences other than those of rising once at night to pass his urine and waiting a little longer than is normal for the starting of his stream. Quite a number of patients after prostatectomy rise not once but twice at night to micturate. If on a patient suffering from so small an inconvenience we inflict a serious and unpleasant operation and subsequently leave him, in his own opinion, not better but worse off than he was before, has he no grounds for grumbling? Surely it were a better policy (provided always that he runs no serious risks) to wait until he has realised the inconvenience of his prostate, and can appreciate the benefit conferred on him by its removal.

There is yet another argument that those in favour of immediate operation in all cases of early enlargement will advance. They will point out that some 15 per cent. of seemingly innocent prostates have within them foci of malignancy. For no other reason than that it will eliminate the risk of malignant disease they consider an immediate prostatectomy advisable. Yet when we examine this argument more carefully we find that it is not so weighty as it appears at first sight. A prostatectomy does not entail the removal of every shred of prostatic tissue, for much may be left behind in the prostatic bed. An operation does not therefore free the patient from all risk of malignant disease, although it may reduce it. That this is so is shown by the fact that malignant recurrence in the capsule after prostatectomy is by no means uncommon. Whilst, therefore, a 15 per cent. risk of malignancy must always be borne in mind in balancing the pros and cons of operation, it cannot be advanced as a complete justification of the wholesale removal of all enlarged prostates.

Many may object that I am adopting an attitude that errs on the side of conservatism. They will point out that far more lives are sacrificed by postponing operation until the patient's health is impaired and his renal function damaged than are lost by overhasty measures. But while it is true that neglect to operate when an operation is necessary is a commoner fault than operating when an operation is non-essential, I am still of the opinion that, if the patient is kept under careful observation, an expectant

*A lecture delivered before the Fellowship of Medicine.

attitude is generally permissible. My justification for this view is that, even in the best hands and with the most promising of patients, prostatectomy still remains an operation to which a very definite risk is attached. Since this risk is the chief factor in arriving at a prognosis and framing a line of treatment, it will be helpful at this point to go into the question in greater detail.

Mortality-rate of Prostatectomy.

It is difficult to estimate the present-day mortality of prostatectomy. Hospital statistics and various private records show wide variations. My own examination of the statistics of two great London hospitals in 1926 revealed as high a figure as 20 per cent.[1] This agrees with the mortality-rate for the general hospitals which was arrived at by Sir J. Thomson-Walker[2] in his Lettsomian lecture of last year, and it compares very badly with the figure for St. Peter's Hospital, which, over a period of 29 years, worked out at 9·9 per cent. Private records have a mortality even less than that of the special hospitals—namely, somewhere about 6 or 7 per cent.

The wide difference in the mortality-rate of general and special hospitals and the less marked variation between the latter and private practice can easily be explained. The lower rate at a hospital like St. Peter's is partly due to the greater experience in prostatic surgery of the operating surgeon and partly to the better knowledge of after-treatment possessed by the resident and nursing staffs. The fact that the prognosis in private practice is still better than that of the special hospitals is due to the fact that patients of the hospital class are more likely to neglect themselves and only to appeal for help in the later stages of their disease, when renal function has begun to deteriorate and the risks of operation are markedly increased. Even when we consider only private patients, it must be confessed that an operation with a mortality of 7 to 8 per cent. must still be classed as a dangerous one. With all the improvements in technique that have occurred in the last 20 years, total prostatectomy still remains a very formidable proceeding.

All the figures given above refer to the suprapubic operation, the one most commonly employed in this country and on the Continent. For the perineal route, which finds greater favour in America, better results are claimed, and H. H. Young[3] has published a mortality as low as 3·4 per cent. for 1049 consecutive cases. That these good results are not universal is shown by the statistics given by J. B. Deaver,[4] who compares the results of 11 different surgeons and arrives at an average operative mortality of 9·6 per cent. When, therefore, general rather than individual statistics are examined, but little difference is found in the mortality-rates of the perineal and the suprapubic operation.

FACTORS AFFECTING THE MORTALITY-RATE.

Age in itself does not markedly influence results. It is the ailments of old age rather than years that must be taken into account. The mere fact that the patient has arrived at the age of 80 is in itself a sign that his constitution is fundamentally sound, and a hale old gentleman of that age may well be a better subject for prostatectomy than a patient of 60 in whom is found marked arterio-sclerosis or a doubtful myocardium. Most surgeons who have an extensive genito-urinary practice have operated on patients of four score years and more, and Freyer performed the operation successfully in a man of 89. It must, however, be borne in mind that the reserve power of octogenarians is limited, and that, should any additional factor exist that renders operation difficult or dangerous, a conservative attitude should be favoured.

Renal lesions.—A comparison of the mortality tables of different authors shows that uræmia is the commonest cause of death after prostatectomy. The state of the kidney is therefore the most important factor in assessing the risk attached to operative interference. For this reason improved methods of estimating renal function and greater attention to the preoperative treatment of the kidneys have done more than any other advance of the last 15 years to lower the risks of a prostatectomy. But even when special care is exercised in postponing operation on patients with damaged kidneys until time has been given for their recovery, uræmia still remains the chief stumbling-block in the path of the genito-urinary surgeon. We can, it is true, arrive at a fair appreciation of the capacity of the kidney to get rid of the waste products of the body, but unfortunately with all our methods we are still unable to assess its reserve power. It is in the lack of margin in the functioning of the kidneys that is the hidden danger.

Prostatectomy is still a septic operation, and sepsis on top of a damaged kidney is the commonest cause of death after operation. If the prostatic capsule be examined microscopically a few days after prostatectomy it will be found that the lymphatics are crowded with organisms, streaming back towards the general lymphatic circulation. Eventually these organisms may reach the kidney and, by infecting an organ that is just managing to meet the needs of the body, bring about death due to a combination of sepsis and uræmia. We may have succeeded in arriving at a fair knowledge of the power of the kidney to excrete. We have no means of estimating its powers of rising to an emergency, and no ability, in spite of such methods as the estimation of blood cholesterol, to assess the patient's resistance to sepsis. It is this intervention of sepsis that explains Cabot's contention that the risks of operation are lessened when the patient has suffered before operation from a mild degree of septic infection, and has achieved a certain degree of immunity to his infecting organisms. It is also on this account that preliminary drainage in cases of gross infection of the bladder is of such vital importance. Sepsis is the unknown factor in our calculation, and at present we have no power to estimate it.

Cardiac lesions.—Next to renal complications as a cause of death after prostatectomy must be placed shock, cardiac failure, and hæmorrhage. Of these three, shock is probably the least important, and when a patient collapses after operation he generally dies of shock and hæmorrhage combined rather than as the result of shock alone. Moreover, the liability to shock varies according to the type of operation performed. It is less marked after the perineal than after the suprapubic operation, and in my experience greater with the open operation than with the old rapid and blind enucleation. Hæmorrhage, once the chief anxiety of the operating surgeon, has nowadays lost some of its terrors. This is due partly to better methods of controlling it, but chiefly to the greater use of blood transfusion.

But, although the vascular system must take second place to the kidneys as a source of anxiety after operation, the existence of a cardiac lesion must always be regarded as an unfavourable point in prognosis. So also must a raised or lowered blood pressure. A low blood pressure predisposes to

collapse during spinal anæsthesia, and—what is of vital importance—carries with it a greatly increased risk of thrombosis and embolism during convalescence. Since pulmonary embolism is by no means a negligible danger after prostatectomy, a low blood pressure should be regarded as an unfavourable factor in prognosis. Of less importance is an increase of pressure, unless it is indicative of renal disease; in this case the pressure will probably fall with the improvement in renal function brought about by preoperative treatment. Operation should always be postponed until the pressure after a period of instability has reached a constant and lower level. Strange to say, high blood pressure does not appear to predispose to reactionary and secondary hæmorrhage.

Pulmonary lesions.—Pneumonia and bronchitis are responsible for some 10 per cent. of deaths after prostatectomy, and for this reason the state of the respiratory tract must be carefully considered when estimating the risks of operation. Unfortunately spinal anæsthesia has little or no effect in reducing the incidence of pulmonary complications, since an intrathecal injection puts out of action the lower costal and abdominal muscles, and thereby hampers respiration. All that we can do to diminish the dangers of bronchitis and pneumonia is to be rapid in our operation, and whenever possible to avoid operating during the winter months. In bad risks the enucleation may be carried out under a combination of local and sacral or caudal anæsthesia. Every care must be taken to reduce the chances of pulmonary complications by sitting the patient up in bed, combating abdominal distension, and maintaining an equitable room temperature. Oral sepsis should have been dealt with previously.

Diseases of the bowel.—Ileus and dilatation of the stomach, although only occasionally directly responsible for death, may prove awkward complications during convalescence. Moreover, by embarrassing respiration and cardiac action, they have an indirect influence on mortality that is greater than the statistical tables show. For this reason the state of the gastro-intestinal tract must be carefully considered when arriving at a prognosis. The old gentleman with a large pendulous abdomen and a history of constipation and flatulence is one who is only too likely to prove troublesome. Post-operative ileus may be the proverbial straw that breaks the camel's back, for not only does it increase the risks of pulmonary complications and cardiac failure, but it is also a predisposing cause of secondary hæmorrhage.

Diabetes.—Before the advent of insulin, glycosuria of any serious degree was considered to be an absolute contra-indication to any operation on the prostate. Not only did the condition increase enormously the risk of anæsthesia but, by predisposing to grave sepsis, diabetes affected the whole course of convalescence. But now that glycosuria is amenable to treatment it is no longer the danger that it was and, provided the patient receives expert pre- and post-operative treatment, it only slightly increases the risks he runs.

Prognosis with Reference to Function.

In prognosis we must consider not only preservation of life but also restoration of function. Fortunately we are here on firmer ground, for the vast majority of patients can be promised that, if they will submit to the ordeal of prostatectomy, a complete restoration of function will be the result. Before making such a promise the presence of certain complications must naturally be excluded. I am convinced that where the bladder wall has been irretrievably damaged by distension and sepsis a complete restoration of function, as evidenced by the entire disappearance of residual urine, is unlikely. Should a diverticulum exist, the result will be still less favourable, unless of course the sac be extirpated before or after operation. So also is a complete recovery of the upper urinary passages impossible in old and neglected cases. All that can be expected here is a restoration of renal function up to a certain level, the level depending on the severity and the duration of the previous obstruction and the amount of sepsis that has been superimposed.

Only in exceptional cases are poor end-results obtained. Every operator has had to deal with such unfortunate operative sequelæ as obstruction, chronic sepsis, calculus formation, persistent fistula, incomplete control, and (rarely) the recurrence of symptoms from the subsequent hypertrophy of prostatic tissue remaining adherent to the capsule after enucleation; but for all practical purposes of prognosis these accidents may be discounted, for by suitable treatment they may be remedied when they occur. It must, however, be admitted that, although lack of control is usually only a temporary inconvenience after suprapubic enucleation, there is a far greater danger of its permanency after the perineal operation.

Occasionally patients inquire before operation whether their genital functions will be impaired by the removal of their prostate. They may be told that, although sterility is inevitable, virility will not be markedly affected. It might be thought that to the patient of prostatic age this point would not be of great importance, but the sexual function sometimes survives well into the 'seventies, and there are many elderly men who would not sacrifice what they regard as a distinction if such sacrifice could be avoided. Loss of virility is more common after the perineal operation.

Prognosis apart from Prostatectomy.

Catheter life.—As a temporary expedient or as a preliminary to operation, catheterisation is an excellent treatment. As a permanent measure it carries a high mortality, because enlargement of the prostate provides ideal conditions for the maintenance of bladder sepsis with its attendant risk of infection of the kidneys. Squier's [5] observations on 30 cases of prostatic obstruction treated without operation provide an excellent illustration of this. He found that half the inoperable cases died within five years of the onset of obstructive symptoms if catheters were not employed. If, on the other hand, patients were put on catheter life, the expectation of life was reduced to two years and ten months. These figures perhaps throw an unnecessarily gloomy light on catheterisation, but even when we take Harrison [6] and Lydston's [7] figures of four or five years we are forced to conclude that catheter life carries with it a poor prognosis. Nevertheless all of us know of patients who have wielded a catheter for many years with apparent impunity, and I have now under my care a medical man who has been passing one since 1916. Such cases are by no means rare, especially amongst well-to-do and intelligent men who can devote to their catheterisation sufficient time and care.

Perhaps the most important factors in determining the prognosis is the ease with which the catheter is passed and the frequency with which it is required. When the prostate is very much enlarged, when the posterior urethra is tortuous and difficult to navigate

and when catheterisation is followed by hæmorrhage or accompanied by pain, there will be little chance of instrumentation being carried out for any length of time. The second factor depends on the amount of obstruction. The life of many a patient with a mild degree of obstruction may be rendered tolerable and even comfortable by passing a catheter once in 24 hours, generally just before going to bed. For others catheterisation three, four, or even six times a day may be necessary; here the prognosis as regards life as well as comfort must inevitably be bad. In such cases some alternative to a catheter must be adopted, unless, of course, the patient is actually on the threshold of the grave.

Permanent suprapubic drainage.—There is no doubt that the only alternative to prostatectomy available to the average patient is the establishment of a permanent drain. Unfortunately I have been unable to obtain any statistical justification of this statement, mainly because the great majority of my patients who have been fitted with a suprapubic drain have malignant prostates, and do not therefore come within the scope of this paper. It can, however, be said that a patient for whom prostatectomy is contra-indicated is in a far better position as regards life with a permanent drain than when dependent on a catheter. Not only is the bladder satisfactorily emptied, but he is able by irrigation to deal adequately with sepsis. The prognosis as regards comfort varies considerably in different patients. I have known men who thought the suprapubic method of emptying their bladders as convenient as the natural method. I have known others who, at the end of two years of drainage, clamoured for prostatectomy with all its risks rather than continue to live as they did. Much depends on the intelligent coöperation of those responsible for the management of the tube and the hygiene of the bladder.

Prognosis of other methods of treatment cannot be fully discussed here. Amongst the remedies that have been employed are deep X ray therapy, diathermy, treatment by galvanism, sinusoidal current, static wave, high frequency, and prostatic massage. But these methods in the case of prostatic enlargement are more often palliative than curative, although sometimes permanent benefit appears to be obtained. Of the more efficient method of using diathermy to remove those portions of the prostate that are responsible for the obstruction, more could be said. This, when used in suitable cases, is a curative measure, but as the type of prostate to which "forage" is applicable is the small obstructing one rather than the gland that is the victim of general enlargement, treatment by surgical diathermy does not really come within the scope of this paper. Nevertheless I can say from a large experience of this particular form of treatment that even in cases of general enlargement forage of the prostate is often a valuable means of affording relief to a patient for whom prostatectomy carries too high a risk. It has the immense advantage of being associated with a mortality-rate no greater than that attached to suprapubic drainage.

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THE MALNUTRITION FACTOR IN RHEUMATOID ARTHRITIS.

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THE first obstacle to progress in the field of so-called rheumatic diseases is the confusion in their present classification. Any chronic condition manifesting itself primarily in the joints or other skeletal structures is apt to be labelled Rheumatism, and a subtitle, such as fibrositis, osteo-arthritis, or rheumatoid arthritis, is then accorded it, as if these ailments were slightly different manifestations of the same disease, which they certainly are not.

The second misfortune which has befallen research into these conditions has been the tendency to ascribe an infective origin to every rheumatic condition the pathology of which is not clear. It is true that there does exist an infective type of arthritis, presumably streptococcal, which is just as definite a clinical entity as is tuberculous, syphilitic, or gonococcal arthritis. In these cases, benefit will result when measures are taken to remove the source of the infection. In rheumatoid arthritis, on the other hand, removal of teeth and tonsils—to say nothing of more remote foci of infection—has not been rewarded by improvement of the disease. The majority of those cases which presented themselves for treatment at the British Red Cross Clinic had been submitted, at one time or another, to dental and tonsillar surgery without benefit. Moreover, clinical and bacteriological examination of the sites of possible infection, including the intestinal contents of the patients about to be described, did not show any deviation from the normal.

This preliminary report deals solely with rheumatoid arthritis. In a previous paper by one of us (F. D. H.), the suggestion was made that this disease is an allergic state produced in a susceptible person by a number of widely different antigens. Sensitisation to any of these may produce symptoms which are progressive, or recur periodically over long intervals of time. Constriction of the smaller blood-vessels results from this sensitised state, leading to devitalisation, damage, and finally destruction of tissues which normally have a poor blood-supply—in particular, fibrous, ligamentous, and articular structures. Such vaso-constriction has been shown to be an integral part of the rheumatoid state, and is caused probably by some disturbing influence, as yet unknown, on the endocrine-sympathetic system. It has been suggested by Oriel and Barber that in rheumatoid arthritis the joint changes and accompanying symptoms are not the result of the toxic action of a micro-organism, but of a secondary antigen produced in the patient's tissues (e.g., in the liver) by the action of a primary antigen, whether that be of bacterial origin or not. Although, therefore, rheumatoid arthritis appears in part at least to be an allergic manifestation, the antigenic substance responsible for it is, we believe, not an exogenous one, but an endogenous one resulting from the action of primary antigens on sensitised tissues.

Several observers, notably Llewellyn, have pointed out that the general symptoms of rheumatoid arthritis are suggestive of a disturbance of endocrine balance.

We have collected, from 20 unselected cases of typical rheumatoid arthritis which presented themselves for treatment at the Red Cross Clinic, clinical, radiological, and biochemical data which appear to confirm the hypothesis that rheumatoid arthritis is due to a disorder of metabolism, and is not, at least directly, a disease of infective origin.

Unlike infective arthritis, which begins with pain in the affected joints, there is commonly in the rheumatoid condition a long history of definite prodromal symptoms. Vague muscular pains initiate the disease. There is loss of appetite, tachycardia, a fall in blood pressure, a slightly raised temperature, sweating of the hands and feet, dermatographia, tremor, general nervousness, loss of weight, and an extreme degree of fatigue disability. These symptoms are referable, as Cramer has pointed out, to overstimulation of the katabolic group of endocrine glands.

When, in this sensitive state, some exciting factor is superimposed—e.g., exposure, physical or mental strain, pregnancy, or perhaps an intercurrent infection—then, after a variable interval, the familiar joint changes develop as painful, symmetrical, fusiform swellings, most prominent in the phalangeal joints, wrists, knees, elbows, and other articulations.

The importance of the general, progressive skeletal atrophy which is apparent before the onset of the joint changes cannot be too strongly emphasised. W. Hale-White, to whom belongs the credit of first differentiating the disease, wrote in 1902: "Muscular wasting is so very rapid that it is clearly an extensive degree of genuine arthritic atrophy not dependent on disuse." He showed by skiagrams that the atrophic condition of the muscles is shared by the bones.

Radiological change is striking even in the early stage of the disease. Dr. Gilbert Scott, who radiographed all our cases, states that the identification of rheumatoid arthritis radiographically is dependent on a general loss of bone calcium, noticeable throughout the skeleton when the disease is active, and that this general osteoporosis occurs long before destruction of cartilage. He takes the hand as his standard in every case, and by comparison with the normal is able to detect the slight decalcification that occurs in the very early stages (Fig. 1). He states that similar changes are seen in such diseases as hyperthyroidism and tumours of the parathyroid—diseases of metabolic origin. This, he agrees, supports the theory that a metabolic factor plays a part in causing rheumatoid arthritis. Total blood calcium estimations were taken in the majority of our cases, but these were always found to lie within normal limits.

DIET AND METABOLISM.

Close investigation of our patients' diet did not show any marked qualitative fault which could account for their serious state of malnutrition. It was decided, therefore, to ascertain to what extent the tissues were making use of their food-supply.

Pemberton, who has made a special study of metabolism in rheumatic conditions, found in most cases that the glucose tolerance is lowered, and the blood-sugar curves approximate to the hyperthyroid or mild diabetic type. Holsti and Fletcher have confirmed this observation, and it can be accepted as a fact that sugar is not stored and used by these patients in the normal manner. Pemberton regarded this abnormality as an indication for the reduction of food intake, particularly carbohydrate. Dr. R. D. Lawrence suggested to the writers that a better knowledge of the power of the muscles and tissues to use sugar would be gained by comparing simultaneously the capillary—i.e., the arterial—and the venous blood. In normal individuals it has been shown that the venous sugar is considerably less than the arterial—i.e., that the arterio-venous difference is great—but when the tissues are unable to utilise glucose, as occurs in diabetes or after an injection of adrenalin, then the difference is small. Dr. J. W. Shackle has done for us not only an ordinary glucose-tolerance test, but a simultaneous arterio-venous comparison in every case. The blood-sugar was estimated by the Folin-Wu method, in duplicate in many instances. In almost every patient, the

FIG. 1.

The radiogram on the left is of a normal hand. The one on the right shows active rheumatoid arthritis in the second stage. Note the loss of bone calcium and cartilage.

blood-sugar four hours after a meal was raised above normal, and the figures at ¾, 1½, and 2¼ hours after 50 g. of glucose had been taken, revealed an abnormal hyperglycæmia. Fig. 2 shows a typical case.

Still more significant, however, is the small arterio-venous difference, the vein in many cases containing even more sugar than the artery (Fig. 3). This shows that the muscles and tissues of the rheumatoid arthritic patient are unable to deal with circulating sugar in the normal way, either storage or oxidation being defective.

Dr. D. T. Davies kindly carried out the basal metabolic rate test on a number of our patients, and reported: "The rate is on the high side, but not generally greater than 10 per cent. above normal."

From the clinical appearance, X ray picture, and abnormal carbohydrate metabolism, it seems clear that in most of these cases the metabolic processes are disturbed even before the onset of joint changes. In the light of present knowledge, the disturbance can be best explained by overactivity of the thyroid and adrenal glands stimulating the sympathetic system, with or without possible insular hypofunction. At any rate, we know that the thyroid and suprarenal hormones—the former perhaps most clearly—produce a disturbance of carbohydrate metabolism similar to that which our cases show. Whether they act by preventing the normal formation of glycogen in liver and muscles from circulating glucose, or whether they also impair the burning of carbohydrate in the

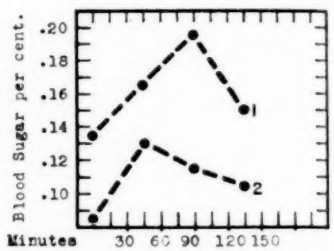
tissues is not yet known; but it is certain that insulin antagonises them and rectifies the abnormal hyperglycæmia and arterio-venous difference. In our view, the blood-sugar findings alone would justify the administration of insulin to these patients. Fig. 4 shows the effect of injecting insulin into a rheumatoid arthritic subject. The blood-sugar curve is reduced to more normal proportions. But apart from the question of improving carbohydrate metabolism in these cases, the administration of insulin has the valuable effect of exciting an appetite for food, thus increasing intake. Anorexia and progressive loss of weight are common in the early stages of the disease. Most of our patients were thin and ate very little. It seemed to us that they needed a more nourishing diet—yet, if a larger and richer diet had to be consumed, an appetite for it had to be created artificially. The value of insulin in this connexion has been advocated already in other types of anorexia.

SCHEME OF TREATMENT.

All our patients, therefore, were placed on a six weeks' course of insulin and dietetic treatment, while receiving physiotherapy at the Clinic. But, in order that the issue should not be confused, such treatment was standardised in every case. In the series are included private patients who could afford to carry out the treatment in their homes, and poorer ones who found this difficult; several of the latter had to work long and arduous hours, returning at night to miserable surroundings where an expensive diet was out of the question. The lady almoner was able to assist, however, by sending some of these to convalescent homes associated with the Red Cross Clinic, where treatment could be carried out more effectively.

Physiotherapy.—The important fact was borne in mind, when ordering physical treatment, that rheumatoid arthritic patients are unable to withstand sudden variations of temperature. They thrive in a warm, dry climate, and fare badly in a cold, damp atmosphere. The very conditions which have produced the highest degree of physical fitness in man are those which the rheumatoid arthritic is unable to tolerate, and it is in these climates that the disease is chiefly found. Heat damps down the thyroid-adrenal apparatus, and for this reason a continuous supply of warm, even, natural sunshine is excellent. Artificial heliotherapy is a fair substitute, but selection of the proper radiation is important. Sonne has shown that the greatest heat penetrability is obtained by radiations in the long wave-length region of the visible spectrum, and for this reason the carbon arc is to be preferred to sources rich in ultra-violet radiations such as the mercury-vapour lamp. The latter have little heat-penetrating power, whereas the chemical effects in the skin and its sympathetic nerve-endings are apt to prove exhausting to the rheumatoid arthritic patient.

FIG. 4.



Blood-sugar curves in Case 10 before insulin (1) and after 15 units of insulin (2).

All forms of physiotherapy which are calculated to produce over-stimulation must be avoided, and re-education to environmental conditions must be slow, and regulated by a strict supervision of the clinical aspect of the case. The importance of rest cannot be overstated, and while undergoing treatment long periods in bed should be enjoined.

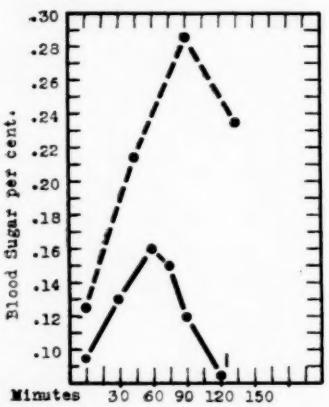
General massage is valuable not only on account of the mechanical effect of producing local hyperæmia, but also because it stimulates the muscles to greater physiological activity, and this assists them in their work of carbohydrate combustion. Fatigue must be avoided at all costs.

The joints received special attention, when necessary, but as this aspect of the treatment does not come within the ambit of this paper, it will not be discussed.

Diet.—It seemed to us that the proper dietary for rheumatoid arthritic patients was one which would counter their general state of under-nutrition. A diet of high calorie value, containing increased fat, average protein and carbohydrate content, was therefore advocated.

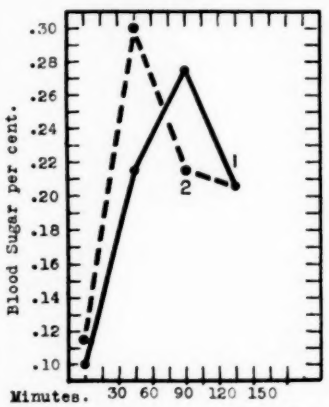
The daily consumption of 500 to 1000 calories in excess of the requirements of the body is necessary for anyone whose weight needs to be increased. Our patients were women who followed comparatively sedentary occupations, but, being of hyperthyroid type, their output of energy was relatively high. The quantity of food required to maintain themselves in a state of physiological equilibrium was estimated at 16 calories per pound of body-weight, or about 2000 calories for a 9-stone woman. A minimum consumption of 2500 calories per day was therefore essential for such a person to gain one pound of fat per week. Breakfast appeared to be the meal for which our patients had the least desire, in spite of the administration of insulin. Their calorie consumption was limited for the most part to the other two main meals of the day, but it was found possible, by interposing additional feeds of

FIG. 2.



Blood-sugar readings in Case 6. The lower curve (1) is a normal curve for comparison. In this and subsequent figures the amount of glucose given was 50 g.

FIG. 3.



Blood-sugar curves in Case 12. 1 = venous blood; 2 = arterial blood.

creamy milk (200 calories per tumblerful), to bring the total to the requisite amount.

The daily amount of protein which we advised was not less than half a gramme per pound of body-weight. There is no real evidence to show that curtailment of meat produces benefit in rheumatoid arthritis. We increased the fat content of the diet, but the actual quantity which can be taken depends largely on a personal factor; individuals vary greatly in the amount of fat which they can consume daily, and in the amount which they can afford to buy, for it is expensive. The most readily available forms of fat are cream, butter, cheese, animal fats, and oils. By the free use of these, the fullest advantage is made of the hunger engendered by the insulin; not only has fat twice the calorie value, bulk for bulk, of carbohydrate but, unlike glucose, it does not terminate appetite by uniting with the insulin. The carbohydrate content was not reduced. Pemberton believes in lowering it, but we found, by the use of insulin, that the power of the tissues to utilise sugar was so improved that any reduction of carbohydrate in the diet appeared to be unwarranted.

Insulin.—Beginning with the injection of five units of insulin, the dose was increased to ten units twice daily, or, in the case of those who attended at the Clinic, 15 units once a day. We found that larger doses than this produced as a rule disagreeable symptoms of hypoglycæmia. The blood-sugar estimations were a rough guide to the probable degree of insulin toleration. As regards the time of administration, half an hour before each of the main meals is best, and some patients were taught to give this to themselves. If delay must occur between the injection and the meal, a glass of milk or glucose in lemon water (2–3 g. to the unit of insulin), and a biscuit should be given immediately. When one daily dose only is administered, it should be injected before the ordinary midday meal; a sensation of hunger will then be experienced about tea-time, when a carbohydrate meal sufficient to satisfy appetite can be consumed.

RESULTS OF TREATMENT.

It must be remembered that a short course of insulin, dietetic and physical treatment cannot be expected to cure rheumatoid arthritis which has become chronic and may have been in existence for months or years. Much more prolonged treatment is essential. Little can be said at present, therefore, regarding the premanency of the benefit conferred, yet the immediate results were uniformly encouraging.

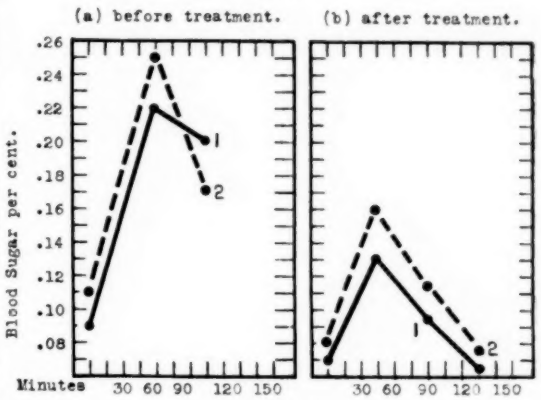
All our patients declared that their general health had improved. Appetite was increased, and in some cases an actual aversion to food was overcome. Naturally, those who ate heartily felt better, but in every case there was also a gain in weight, amounting from four to as much as ten pounds. That this general physical improvement was not due solely to increased food consumption was shown by the amelioration of those other symptoms which accompany sympathetic overstimulation. In particular, fatigue was not produced so quickly or so easily. Fig. 5 shows the blood-sugar curves of a patient taken before and after a course of treatment. The difference is striking. This patient felt so much better that she returned to her employment. All our patients except one felt their joints to be freer in movement and not so painful. In some, the less affected joints cleared up altogether, in others the swelling diminished. Radiological examination of the hands has not so far revealed any return of calcium salts or other change as a result of treatment, but if the condition of osteoporosis appeared to be no better, at any rate it was stationary and not worse.

The following are notes of 20 cases:—

Abbreviations.—R.E. = radiological examination; B.E. = bacteriological examination; S.R. = sedimentation rate; T.B.C. = total blood calcium; G.T.T. = glucose-tolerance test; B.M.R. = basal metabolic rate.

CASE 1.—Miss A. Aged 20. Undernourished as a child. Mother committed suicide one year before onset of disease. Three years ago pain and swelling developed in hands and feet. Is now unable to work. No evidence of sepsis. R.E.: rheumatoid arthritis of second degree. S.R.: 1st hour 36 mm., 2nd hour 63 mm. G.T.T.: 1½ hours after glucose blood-sugar rose to 0·18 per cent., and after 2½ hours had fallen to 0·14 per cent. B.M.R.: plus 10 per cent. Result of treatment: after two courses, each lasting six weeks, improvement was marked. She felt more energetic and ate more. Weight increased by 8 lb. Joints are less painful and can be moved more freely. Now fingers can be moved on palms, and walking is easier because pain and stiffness less.

FIG. 5.



Blood-sugar curves in Case 4 before and after treatment: 1 = venous blood; 2 = arterial blood.

CASE 2.—Mrs. B. Aged 27. Disease began six years ago, affecting both hands and later left sacro-iliac joint, knee, and ankle. No evidence of sepsis. S.R.: 1st hour 31 mm., 2nd hour 45 mm., 24 hours 69 mm. G.T.T.: resting sugar, 0·14 per cent.; curve reaches 0·28 per cent. after three-quarters of an hour, and falls to 0·17 per cent. only after 2½ hours. Result of treatment: during the first course she improved greatly, but relapsed afterwards. She is now completing the second course. Her joints are less swollen and painful, can be moved more freely, and in consequence can sit and walk in greater comfort.

CASE 3.—Miss C. Aged 31. Disease began 12 years ago. At first she felt out of sorts and debilitated; some time later pain in hands developed and spread to elbows, feet, and ankles. Two years ago had all back teeth removed and tonsils enucleated. R.E.: osteoporosis and eburnation of cartilage in small joints of hand and wrist. B.E.: fæces yielded a rich growth of *B. coli* only. Result of treatment: after two courses great improvement. Gain in weight of 4 lb. Joints are less painful and more movable. Passive movements of elbows are now possible, whereas they could not have been borne before. Sociological conditions were adverse, yet good result has been attained.

CASE 4.—Miss D. Aged 31. Four years ago she passed through a period of anxiety and mental distress. A year later pain commenced in feet and spread to left shoulder, hands, and knees. No evidence of sepsis. R.E.: very early bone changes in phalanges. S.R.: 1st hour 16 mm., 2nd hour 42 mm. T.B.C.: 11·09 mg. per cent. G.T.T.: curve rises as high as 0·25 per cent., and fall is delayed; after 1¾ hours venous blood-sugar is higher than arterial. Result of treatment: very much better. Gain in weight is 9 lb. Feet, knees, and shoulder are less painful and swollen. Right hand still troublesome, but is better than it was. Is returning to her employment.

CASE 5.—Mrs. E. Aged 41. Disease commenced three years ago following a long period of anxiety and mental

distress. Hands and feet are affected. All teeth have been removed without benefit or even reaction occurring. R.E.: rheumatoid arthritic group of slow progressive type. B.E.: fæces gave a profuse growth of *B. coli* with one or two isolated colonies of *Streptococcus fæcalis*, but not in excess. S.R.: 1st hour 53 mm., 2nd hour 78 mm., 24 hours 91 mm. T.B.C.: 10·04 mg. per cent. G.T.T.: venous curve approximates closely to the arterial, both reaching a height of 0·21 per cent. an hour after taking glucose, without glycosuria. Result of treatment: feels much better. Appetite and sleep improved. Gained 10 lb. in weight. Ankles and feet are less painful and more movable, hence can walk more comfortably.

CASE 6.—Miss F. Aged 22. Disease began in right wrist, spreading to ankles, other wrist, and right foot. Has had all possibly decayed teeth removed. R.E.: rheumatoid arthritic group. S.R.: 1st hour 31 mm., 2nd hour 63 mm., 24 hours 96 mm. T.B.C.: 11·9 mg. per cent. G.T.T.: high resting sugar (see Fig. 2). Result of treatment: feels stronger and not so easily tired. The joints are the same as regards stiffness, but pain and swelling are less. Desires a second course of treatment.

CASE 7.—Miss G. Aged 24. Disease started at age of 7 in thumbs. At the age of 14 hands became involved, and later knees and elbows. R.E.: typical rheumatoid arthritic group of second degree. B.E.: fæces showed an excess of intestinal streptococci, but organisms of definite pathogenic type were absent. G.T.T.: 2½ hours after taking glucose, the venous curve is 0·02 per cent. higher than the arterial. Result of treatment: after one course weight increased 6 lb. General health is better, and joints, particularly the hands, are not so swollen and painful.

CASE 8.—Miss H. Aged 30. Prior to onset was debilitated and worried. Disease started three years ago with vague muscular pains, which settled later into the joints. One and a half years ago had eight teeth extracted and tonsils enucleated without apparent benefit. S.R.: 1st hour 12 mm., 2nd hour 30 mm. G.T.T.: resting sugar, 0·13 per cent.; rises to 0·20 per cent. three-quarters of an hour after taking glucose; venous curve approximates closely to the arterial. B.M.R.: plus 8 per cent. Result of treatment: shoulders are much less painful, and can sit now, whereas she used to have to stand or walk in order to be comfortable. Does not waken now at night on account of pain. Weight increased by 5 lb. Relapsed after treatment stopped. Improved after second course of treatment had been begun.

CASE 9.—Miss I. Aged 26. Disease started three years ago with vague muscular pains, followed later by pain and swelling of ankles, knees, and hands. Previous illness: rheumatic fever. Teeth and tonsils removed without apparent benefit. S.R.: 1st hour 14 mm., 2nd hour 46 mm., 24 hours 107 mm. G.T.T.: shows delayed sugar removal. Result of treatment: after one course joints looser and not so painful. Appetite much improved. Feels more energetic and less easily tired.

CASE 10.—Miss J. Aged 39. Disease began one and a half years ago in shoulders, knees, and wrists. One year ago the back also affected. R.E.: slight changes in hand, suggestive of early rheumatoid arthritis. S.R.: 1st hour 37 mm., 2nd hour 64 mm. T.B.C.: 11 mg. per cent. G.T.T.: (see Fig. 4). Result of treatment: feels much better. The knees are smaller, and the swelling of the hands has gone down. The back is not nearly so stiff in the mornings, and all joints are more movable. Appetite is greater, and can now eat more fat, cream, and butter than formerly. Gain in weight is half a stone.

CASE 11.—Miss K. Aged 36. Disease started four years ago after the strain of nursing a sick mother. Commencing in ankles, it spread to shoulders and hands, progressing in the latter to partial ankylosis. Had many teeth extracted without apparent benefit. R.E.: typical bone changes of rheumatoid arthritic group, with slight eburnation of cartilage. B.E.: fæces showed numerous colonies of *B. coli* and a few of *Streptococcus fæcalis*. S.R.: 1st hour 12 mm., 2nd hour 25 mm. G.T.T.: highest point of curve is 0·18 per cent., and three-quarters of an hour after glucose the venous blood-sugar is higher than the arterial. Result of treatment: after the first course, considerable improvement in general and local condition. After seven weeks without any treatment, and with the shock of her mother's death superadded, she relapsed badly. A second G.T.T. showed highest point of curve 0·23 per cent.

CASE 12.—Miss L. Aged 22. Disease commenced two years ago in toes, spreading later to hands, elbows, and knees. Had four teeth extracted without apparent benefit. R.E.: early rheumatoid arthritic changes. S.R.: 1st hour 27 mm., 2nd hour 49 mm. T.B.C.: 10·3 mg. per cent. G.T.T.: shown in Fig. 3. Had already been given a course of special treatment on metabolic lines at the Clinic. This consisted of parathormone (0·5 c.cm.), by intramuscular injection, and calcium glucinate (10 c.cm.), by intravenous injection. After an interval of two months insulin and dietetic treatment was inaugurated. The improvement in her general health was maintained.

CASE 13.—Miss M. Aged 52. Disease started seven years ago, affecting neck, feet, hands, and knees in that order. B.E.: fæces did not show organisms of definitely pathogenic type. Moderate numbers of intestinal streptococci were present. S.R.: 1st hour 12 mm., 2nd hour 25 mm. T.B.C.: 10·6 mg. per cent. Hæmoglobin 80 per cent. G.T.T.: resting sugar is 0·11 per cent.; highest point of the curve is 0·18 per cent. at 1½ hours, falling at 2½ hours to 0·17 per cent. Result of treatment: improved after first course, when she gained 3 lb. in weight. Relapsed after treatment was stopped, losing 6 lb. in six weeks. Is regaining what she lost on second course.

CASE 14.—Mrs. N. Aged 40. Comes of a delicate stock. Disease began with vague muscular pains three years ago, and later pain and swelling developed in hands and ankles. Had her tonsils removed without apparent benefit. S.R.: 1st hour 85 mm., 2nd hour 121 mm. G.T.T.: resting sugar is 0·12 per cent.; curve reaches 0·22 per cent. at three-quarters of an hour, falling to 0·08 per cent. at 2½ hours. The venous concentration is higher at 1½ hours than the arterial. B.M.R.: plus 8 per cent. Result of treatment: considerably improved. Less easily tired. Gained 1 lb. in weight each week. Less pain and more movement in each joint; swelling of knee has disappeared.

CASE 15.—Mrs. O. Aged 43. Onset of disease was preceded by vague muscular pains which passed off after a time. One year ago, pain and swelling of hands, wrists, elbows, and ankles developed. Clinically a typical case. Teeth good, tonsils not infected. Result of treatment: considerably improved. Feels fitter and is less easily tired. Gain in weight is half a stone. Can now use a knife and fork, and walk round garden, neither of which she could do before treatment.

CASE 16.—Miss P. Aged 50. Has suffered from aching muscles and fibrositis since the war. Prior to onset of the disease became debilitated from nursing her father. One and a half years ago joint manifestations developed. Teeth good, tonsils enucleated since becoming ill. Complication: psoriasis. S.R.: 1st hour 35 mm., 2nd hour 62 mm. G.T.T.: resting sugar is 0·12 per cent.; rises to 0·25 per cent. at 1½ hours. Result of treatment: improvement. Pain is not so continual, and joints are more mobile.

CASE 17.—Miss Q. Aged 31. While working in a factory felt out of sorts, becoming unduly fatigued. Two years ago disease began in finger and spread to wrists, right shoulder, and left knee. Had five teeth extracted without apparent benefit. R.E.: rheumatoid arthritic group. Some osteoporosis and loss of cartilage in wrist-joint. G.T.T.: resting sugar is 0·14 per cent. Three-quarters of an hour after glucose the curve rises to 0·3 per cent., falling to 0·25 per cent. at 1½ hours and 0·18 per cent. at 2½ hours. Venous concentration is higher than arterial at 1½ hours. Glycosuria appeared at height of curve. Result of treatment: disappointing, but interesting. After a fortnight's treatment with insulin (10 units a day) a sharp reaction of pain, heat, and swelling occurred in left knee and right finger. Insulin was stopped for a week, and joints subsided. On resuming, a more marked flare-up of the same joints occurred, which the patient attributed entirely to the injections. This case was the only one in the series to show a focal reaction to insulin.

CASE 18.—Mrs. R. Aged 37. Disease commenced 15 years ago. Spine, left shoulder, and wrist affected. Wrist-joints now fixed—the right complete y, the left 10 degrees of movement. R.E.: rheumatoid a thritic group; quiescent stage. S.R.: 1st hour 4·5 mn , 2nd hour 11 mm., 24 hours 28 mm. T.B.C.: 10·9 mg. per cent. G.T.T.: resting sugar 0·136 per cent.; curve reaches above 0·20 per cent. at 1½ hours, and falls at 2½ hours to 0·258 per cent. only. Result of treatment: owing to the advanced stage of the disease great improvement could not be expected. Appetite increased. Is not so easily tired. Considerable increase in mobility of wrist-joints. Pain in back and shoulder has practically disappeared.

CASE 19.—Miss S. Aged 50. Had been overworking when her father died. Some time later fingers became painful and swollen, then wrists, knees, and ankles were affected. R.E.: rheumatoid arthritic group. Changes more marked in knees. S.R.: 1st hour 48 mm., 2nd hour 104 mm. G.T.T.: curve reaches height of 0·26 per cent. 1½ hours after glucose, and falls to 0·15 per cent. only at 2½ hours. Result of treatment: gain in weight of 4 lb. Felt better, and joints became less painful while taking insulin.

CASE 20.—Miss T. Aged 28. When she was over-tired and run down pain in neck developed. Later, fingers and feet became affected. Impacted wisdom teeth removed since onset of disease, but without arresting progress of the illness. R.E.: early rheumatoid arthritis, slight osteoporosis, and loss of cartilage. T.B.C.: 12·4 mg. per cent. G.T.T.: resting sugar 0·14 per cent.; curve reaches 0·194 per cent. at end of 2½ hours. Result of treatment: gain in weight is 5¾ lb. General health improved. Joints are less stiff and painful, while swelling is much less. Discharged greatly improved.

It is not suggested in this article that, by the use of these methods, a cure for rheumatoid arthritis has been found. A number of our patients relapsed within a short time after treatment was stopped. For instance, Case 11 reported after seven weeks: "My joints are worse than when I gave up treatment, and I do not feel so well in myself." Her blood-sugar curves had retrogressed markedly. On returning to insulin and dietary she improved again. It will be interesting to observe the effect of continuing her treatment over a period of a year or more. The results on the whole, however, proved beyond question that the immediate effect on a rheumatoid subject of a diet of high calorie value combined with insulin therapy, enforced mental and physical rest, and constant and systematised physiotherapy is good. It is our impression that a more careful selection of cases in regard to duration of the illness, age, and the not less important sociological element would have obtained even better results than we have shown. We submit that the malnutrition factor in rheumatoid arthritis is a striking one, and that treatment of this progressive and crippling disease on metabolic lines will achieve a greater measure of success than has yet accrued from the pursuit of problematical sources of infection, vaccine or immunisation therapy.

We would like to express our appreciation to the matron and lady almoner of the Red Cross Clinic for their keen coöperation, to Drs. Scott and Shackle for their respective examinations of the cases, and to Dr. Lawrence for his helpful criticism of this report.

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A HOSPITAL EMERGENCY.—Insufficiency of accommodation at Lincoln County Hospital has been making itself increasingly felt, and on a recent night so many emergency cases were admitted that 15 extra beds had to be provided. It is stated by the *Lincoln Echo* that "children, some with fractured limbs, have been placed in laundry baskets, while another little boy has been compelled to spend a night on two chairs." It is, however, explained that, with mattresses and blankets, these patients were made quite comfortable. The hospital, which has a waiting list of more than 200, is in course of enlargement.

AN EPIDEMIC OF THE BULBAR TYPE OF POLIOMYELITIS.

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THIS epidemic was observed in a school during the months of May and June, 1929, and was thought to be an outbreak of pharyngitis until signs of brain-stem involvement appeared. The clinical features were carefully noted, and showed the epidemic to be one of poliomyelitis consisting of abortive and bulbar cases only. There was no paralysis due to spinal involvement. A search of published papers reveals an increase in the number of cases of bulbar poliomyelitis reported in recent years, but no epidemic has been described consisting of bulbar and abortive cases only. As the epidemic appeared to be unique the diagnosis was confirmed by the neutralisation test in monkeys.

Though the names of Heine, Medin, and Wickman are those most closely connected with the recognition of poliomyelitis, A. Strümpell in 1880 was the first to record cases of "polio-encephalitis" and to regard them as a bulbar type of the more usual infantile paralysis. I. Wickman discussed the brain-stem type in his observation on the Swedish epidemic of 1905. Since then cases have been reported more frequently, and the following Table gives the details of some of the epidemics of poliomyelitis during the past 20 years in which the brain-stem type of the disease was recognised.

Date.	Collection of cases.	Reported by—	No. of cases.	Brain-stem cases.	Per cent. of total.
1905	Sweden.	I. Wickman.	868	22	2·5
1909	Experimental.	S. Flexner.	81	8	10
1900–1910	Great Ormond-street.	C. Bremer.	400	43	10·7
1912	New York (Rockefeller Hospital).	F. W. Peabody, G. Draper, and A. R. Dochez.	71	4	5·5
1925	Saskatchewan.	F. B. Walshe.	55	8	14·5
1926	Broadstairs.	A. S. MacNalty.	55	32	58
1926	Manitoba.	J. McEachern.	6	6	100
1927	Massachusetts.		436	76	17·4
1927	New Jersey.	F. A. Levinsohn.	10	5	50
1929	Long Island.	H. B. Smith.	17	8	47
1929	Rumania.	G. Marinesco.	130	12	9·2

A review of the literature leaves no doubt that reports of brain-stem cases are much commoner than formerly, and this fact may be associated with the undoubted increase in the incidence of non-suppurative encephalitis during recent years.

The Epidemic.

The present series of cases occurred over a period of seven weeks in a co-educational boarding-school, situated a quarter of a mile from a small country village and standing in its own grounds. Out of a total of 11 teachers, 56 pupils, and eight domestic staff, 15 individuals were ill during this period; there was no other illness in the school during this term.

The school is on the boundary between two public health officers districts; in one, no other case of poliomyelitis was reported, whereas one case in the other area was reported during the same period. This was of the bulbar type, though developing an upper arm palsy on the fourth day. No direct

connexion can be traced between this case and the school, but it occurred in a town six miles away where a number of the school-children live. It was necessary to accept the medical officer's figures as to the incidence of poliomyelitis, for it proved impracticable to collect from individual medical men details of possible cases. There may have been cases of this rare but little recognised group which were not notified.

Of the 15 cases occurring in the school, eight have been classed as abortive cases while seven, including those with meningeal symptoms, showed involvement of the central nervous system.

Age.—The ages of the pupils at the school vary between 6 and 13 years, and of the four house-boys between 14 and 16 years. No child under 8 was ill during the term and two adults (ages 24 and 34) were affected. The average age of all the children affected was just over 9 years. The commonest age at which poliomyelitis is seen is said to be 1 to 3 years, and it is stated to be rare over 8. In the Broadstairs epidemic it was noticed (MacNalty, 1925) that, whereas the spinal cases were usually in children under the age of 5, the brain-stem or cerebral cases usually occurred over 5. The present series bears out the observation made at Broadstairs.

Sex.—Of the 15 cases in the series six were female and nine were male. Both the adults were female.

Season.—The epidemic was in May and June, 1929, and the dryness of this spring and early summer may account for its unusually early appearance.

Immunity.—Only two children in the school had previously suffered from poliomyelitis, one from the spinal form and one from the bulbar. Both had been attacked more than two years previously. At the time under consideration neither child was in any way ill.

Mortality.—Out of a total of 15 cases one was fatal, representing a mortality of 6·5 per cent.

Symptoms and Signs.

Except for a few cases, the present epidemic would have passed as an epidemic of pharyngitis, which was indeed the first diagnosis made. The majority of the cases fall into the abortive or prodromal group and the remainder into the bulbar group, though for the first three days they had symptoms corresponding exactly with those of the abortive cases. The signs and symptoms are considered under three headings: (1) symptoms of general infection; (2) symptoms due to involvement of the central nervous system; (3) cranial nerve pareses and paralyses.

(1) SYMPTOMS OF GENERAL INFECTION.

The recognition of the disease in this stage is of the utmost importance, as only after early diagnosis can treatment be hopefully instigated.

The *onset* of the disease was usually sudden; in almost every case the child looked flushed and the temperature was found to be between 102° and 103·8° F.

Sweating was usually present.

The *general condition* of the children was good, and they were not unduly drowsy or irritable. In nearly every case the child appeared bright in spite of the fever; in view of the later developments this was a striking feature. This unusual sense of well-being may have been due to the fact that one was dealing with a bulbar and not a spinal condition; pain in the limbs, spontaneous or on passive movement, is a frequent early sign in the spinal form and makes the child feel ill. Later, with involvement of the central nervous system, the children became anxious and frightened.

The *pulse-rate* was raised in most cases, corresponding with the degree of fever.

Vomiting or nausea was an early sign, and in four cases nothing was suspected before a sudden attack of sickness; these cases were found to have a very sharp rise of temperature. Over half the cases had nausea or vomiting in the early stages.

Diarrhœa accompanied by very severe vomiting was present in one case. Constipation was not a feature of this epidemic.

Abdominal pain was present on the first day in Cases 1 and 5. It was epigastric, though it became localised to the right iliac fossa in one case, and subacute appendicitis was simulated.

Only one child (Case 8) had a rash; this was typically scarlatiniform. It was associated with vomiting, a temperature of 103·4°, and an acute tonsillitis and pharyngitis. By itself, this case might have been diagnosed on the first day as one of scarlet fever, but the rash faded next day, and the temperature fell to normal during the next three days. There was no peeling at any stage of convalescence.

Pharynx.—The main feature of this series was the presence in every case of pharyngitis or tonsillitis. Very few patients complained at the onset of sore-throat; a few complained later. Some did not complain at all, but in only two cases was it doubtful that acute pharyngitis, with or without tonsillitis, was present in the early stages. Tonsils or their remains were present in 11 cases, and the tonsils had been completely enucleated in four cases.

(2) NERVOUS SYMPTOMS.

Headache was variable; some of the cases complained of little or none. Thus Case 9, fatal on the seventh day, complained of no headache whatever until the fifth day; it was associated with stiffness of the neck, and occurred after the "choking fits" had started. The three patients who complained of stiffness of the neck also had severe headache.

No *head retraction* was noticed except as a terminal sign in Case 9.

Stiffness of the neck and resistance to flexion was noticed in five cases, and was probably a sign of meningeal irritation. In association with this, one patient complained of tenderness over the cervical spine.

Stiffness of the limbs was complained of by five patients, and was the only sign of spinal involvement in these bulbar cases. Peripheral reflexes, muscle tone, and muscle sensation were normal, except in Case 11, who had diminished knee-jerks for one day. Spasticity of the lower limbs with increased reflexes and a positive Babinski sign were present as a terminal sign in Case 9.

An incisive *cough* was a notable feature on the second day in five cases, and was characteristically heard in children who afterwards developed choking attacks, which were preceded by an increase in the cough. It was probably due to involvement of the tenth nucleus.

Both adults and one child—Case 2—complained of *giddiness*, made worse by sitting up, and lasting for the second and third 24 hours. Nystagmus was not present.

The fine *tremor* of the fingers which is frequently met with was not a feature of this epidemic. It was observed once—Case 9—and then only on the fifth day, in a case which proved fatal on the seventh day.

Delusion.—Case 11, aged 11, who for a short time showed signs of meningeal involvement by stiffness of the neck muscles, complained that his sheets

were covered with spikes, and was genuinely frightened by the delusion.

No cases were *lethargic*, and sleep was no more disturbed than would be expected in children with pharyngitis.

(3) CRANIAL NERVE PARESES AND PARALYSES.

Third, fourth, and sixth nerves.—One case—Case 15—showed *nystagmus*, which may have been evidence of lack of coördination between the intrinsic eye muscles due to lesions of the oculo-motor nuclei, but in this event one would have expected some ptosis or ophthalmoplegia. As the voice was nasal in character, it seems probable that the condition was produced by interference with the cerebellar tracts in the pons in the region of the ninth nucleus.

Seventh nerve.—Two cases—Cases 2 and 9—showed facial paralysis. One of these died; and the other, nearly 12 months later, still has a weakness of the left labial muscles.

Ninth and tenth nerves.—These nuclei are considered together, as both are in all probability responsible to some extent for nasal voice, difficulty in swallowing, and choking. Three cases—Cases 9, 13, and 15—were noticed to have a *nasal voice*, though the palate moved well and normally in the early stage. One of these patients developed palatal paralysis with regurgitation in the terminal stage. Cases 2 and 9 developed *choking attacks* associated with *difficulty in swallowing*; though seen in only two cases, these symptoms were the most striking early feature of nerve involvement during this epidemic, and one which at once indicated that the malady was more than a simple pharyngitis. A feature of the nerve involvement was the rapidity with which this and other palsies developed. As stated above, it is probable that the characteristic cough occurring in five cases was central in origin.

Twelfth nerve.—In one case only (Case 4) was there any suggestion that the tongue was involved; the case occurred early in the epidemic and was not recognised at the time, as the patient did not report sick. The details are obtained from herself and her colleagues. The tongue "felt funny," seemed difficult to control, and a slight change in speech was noticed. This shows how the mild case may be missed, and how, indeed, a whole epidemic might pass unnoticed.

CEREBRO-SPINAL FLUID.

An examination of the cerebro-spinal fluid was made in two cases—Cases 9 and 13. The fluid was clear in one and very slightly opalescent in the other. The cell count was found to be 60 and 88 cells respectively per c.mm., and in each case only lymphocytes were present. No organisms were seen in films or cultures and no tubercle bacilli were present. Fehling's reduction was present in both cases, and the albumin was normal in amount. In both, the globulin content was increased, there being a definite cloud with a saturated solution of ammonium sulphate. The chloride content was 0·702 per cent. and 0·72 per cent., which is almost within normal limits, though the former is somewhat low.

These results are characteristic of poliomyelitis. Some authorities state that 98 per cent. of cases can be diagnosed by this means (J. Collier, 1927). In no case was the fluid taken early enough to show the polynuclear cell increase which is described as a feature of the first 24 or 48 hours.

CLINICAL SUMMARY.

In summarising the symptoms of this epidemic, the abortive and fully developed cases must be considered separately. The typical picture of an abortive or prodromal case was one of a flushed child, probably sitting up in bed, who did not appear ill; the skin was moist and he was obviously feverish, but was bright and intelligent, laughing at the tests he had to perform. He did not complain of pain, except perhaps in connexion with some degree of stiffness of the neck or back. His throat felt dry and he was troubled by a frequent and incisive cough. The temperature and pulse were raised but became normal after three or four days; the throat was reddened and dry, the tongue somewhat furred. Cervical lymphatic glands were not enlarged or tender, and nothing abnormal was discovered on examination of the central nervous system, chest, or abdomen.

If the illness developed beyond the prodromal stage, the temperature was found to be raised again on the third or fourth day. The child was quieter than previously and appeared more ill, though still insisting that he felt well. The cough was more troublesome and he began to say he did not want to drink and could only be persuaded to do so with difficulty; he looked frightened. That night he had a "choking" attack. Later his voice became nasal in quality and a facial weakness or some other cranial nerve lesion appeared.

It is obvious that, without a clue from the second picture, the first could not be diagnosed as one of poliomyelitis. An examination of the cerebro-spinal fluid in the early stage would be of considerable help. Even in the advanced type of case there may be much difficulty in diagnosis.

Case Notes.

The following are notes of the cases. The children returned to school on May 8th.

CASE 1.—A male, aged 8, on May 9th had a temperature of 103°, with slight headache, injected fauces, and vomiting. Later he had general abdominal discomfort, more marked in the right iliac fossa. The bowels were well open, and the patient was well in four days.

CASE 2.—A male, aged 12, had been in the sick-room since May 9th, suffering from burns of the face and right ear. On May 16th, when the burns were almost healed, he complained of "feeling hot, but otherwise quite all right." His temperature was 102° and his pulse-rate 88; he had follicular tonsillitis and marked pharyngitis with swelling of the pharyngeal adenoid tissue and a furred tongue. The throat swab showed no Klebs-Löffler bacillus or organisms of Vincent's angina. On culture it yielded mainly long-chained, slightly hæmolytic streptococci; also *Staphylococcus albus* and pneumococcus.

Forty-eight hours later the temperature was 98·4°–99°. The pulse-rate was keeping over 120, and he had a dry irritative cough on sitting up. The throat showed marked improvement. On the third day he vomited and complained of giddiness on sitting up. Heart, lungs, cranial nerves, and nervous reflexes were normal on examination. On the fifth day his temperature was 100° and rising; his pulse-rate 100 and falling. He was rather pale and sweating. The matron said she was awakened in the night by the boy choking. "He had two attacks of choking lasting two minutes and appeared to have difficulty in getting his breath, accompanied by choking." There was no stridor. The pulse was poor and the patient cyanosed; after the attack the pulse-rate was 60. The patient was not unconscious and had no spasm of the limb muscles. The cranial nerves, motor functions, and reflexes appeared normal. Throat and nasal swabs showed no Klebs-Löffler bacillus. A leucocyte count was 14,000 per c.mm. On the sixth day his temperature was 105°, his pulse-rate 120, and his respiration-rate 30. He was removed to hospital. Further choking fits were observed, and consisted in difficulty in breathing associated with swallowing movements which resulted in choking, followed again by obstructed inspirations, though with no laryngeal stridor. This sequence was repeated, and lasted for some seconds. The child became cyanosed and the throat contained mucus. Frequent attacks continued throughout the day and night, the patient sleeping between attacks.

On the seventh day the choking attacks were less frequent and less severe. The temperature was 101° and the pulse-

rate 120. The area of cardiac dullness was increased slightly to the left, and a soft systolic murmur was heard at the apex. On the ninth day a left facial paralysis was observed; the forehead was very slightly affected. There was inability to close the left eye tightly, the eyeball being seen to roll upwards. The left facial and labial muscles were chiefly affected. Other cranial nerves, motor functions, and reflexes were normal. On the tenth day the tongue protuded to the left. On the twentieth day the facial palsy was improved except for the left labial muscles. The tongue moved normally.

After six weeks the child was allowed up. The area of cardiac dullness and the heart sounds were normal. There were no voice changes, and the tongue movements were normal. There was no weakness of any face muscles except the left labials and the left buccinator.

Eleven months later facial weakness still persists, though there is no disability now. There are no mental changes. Reaction of degeneration is present in the orbicularis oris, and there is a weak response to faradic stimulation of the left levator labii superioris muscle.

CASE 3.—A male, aged 8½, on May 17th was flushed, with a temperature of 100°, a pulse-rate of 102, and pharyngitis. His tongue was slightly furred. Nothing abnormal was found on examination of the nervous system.

On the second day the temperature and pulse-rate were normal, and the child appeared quite well and remained so.

CASE 4.—A female, aged 26, was in bed for one day with a temperature of 100·6° and aching arms and legs. She felt giddy and had a slight dry cough. She was out of sorts for some days, and complained of a "strange feeling in the tongue, which felt large and uncontrolled." There was no difficulty in movements, but speech was thought to be slightly altered. She did not report sick.

CASE 5.—A female, aged 10, was diagnosed on May 22nd as subacute appendicitis. She had a history of two previous attacks, three years before and three weeks before. She had a temperature of 99° and her tongue was furred. There was slight tenderness in the right iliac fossa. She was taken home, and the doctor reported that the condition improved rapidly. An X ray examination was made and "no evidence of appendicitis was found."

CASE 6.—A male, aged 8, on May 26th had a temperature of 103·6° and a pulse-rate of 120, with headache and slight dry cough. The tongue was furred, the tonsils enlarged, the posterior pharyngeal wall much reddened, and the tonsillar lymphatic glands enlarged and tender. No abnormal signs were found in the central nervous system.

On the second day the temperature and pulse-rate were normal. The tonsils and cervical glands subsided during the next few days.

CASE 7.—A male, aged 11, on May 27th had a temperature of 102·4° and a pulse-rate of 104, but "felt well." The fauces were slightly reddened. There were no symptoms, and no other sign at all. He was well in 48 hours.

CASE 8.—A male, aged 8, was well all day but in the evening of May 31st he vomited. His temperature was 103·6° and his pulse-rate 112. He had no headache or discomfort in the throat, but felt sick. The tonsils were enlarged and injected and acute pharyngitis was present. The tongue was thickly furred. The central nervous system was normal. A definite papulo-erythema appeared over the chest and back—a scarlatiniform rash, which faded during the next day. The temperature fell to normal by lysis during the next three days. There was no peeling at any stage of convalescence.

On June 2nd, there was no illness in the school and all the children were back at work, except Case 2, who was still in hospital.

CASE 9.—A female, aged 8, vomited on June 9th. She had a temperature of 102·6°, a pulse-rate of 130, and a slight dry cough. The pharynx was reddened, and the tongue furred. Nothing abnormal was discovered on further examination. The temperature fell by lysis and was normal on the third day. On the fourth day the temperature was 101·8° and the pulse-rate 100; she felt sick and *would not drink*, but said she felt quite well, and appeared so. The pharynx and tonsillar fossæ appeared normal and the tongue was clean. Examination showed slight stiffness of the posterior muscles of the neck. The central nervous system showed nothing abnormal on examination. During the night one slight choking fit occurred similar to those of Case 2. On the fifth day the temperature was 101·2° and the pulse-rate 100, but she was feeling well. The cranial nerves showed nothing abnormal and the reflexes were normal. A very fine tremor of the fingers was noticed, but no incoördination and no further attacks of choking. Cultures of a throat swab on serum gave Gram-positive cocci, non-hæmolytic streptococci, and pneumococci. No diphtheroids were grown on blood-agar.

On the sixth day the temperature was 100° and the pulse-rate 108. For the first time the patient complained of headache, which was not severe but generalised. Further attacks of choking occurred but were slight and of short duration. There was fine tremor of the fingers. The voice was nasal but the palate moved well. The cranial nerves and nervous system were otherwise normal. On the afternoon of the same day the temperature was 101·8° and the pulse-rate 100; she had recurrent attacks of choking for 1½ hours. During the attacks she became cyanosed but did not become unconscious. No spasmodic contractions were seen, but she seemed to choke with mucus in the throat, and then cough and choke again. The choking appeared to be more in the pharynx than larynx; frothy mucus was present in the mouth; there was no laryngeal stridor. Later that night facial paralysis was noticed, most marked in the labials, both right and left. At midnight, under light A.C.E. anæsthesia, lumbar puncture was performed, when 12 c.cm. of very slightly opalescent fluid was withdrawn under slightly increased pressure, and 5 c.cm. of serum, obtained from 10 c.cm. of blood from Case 2 two hours previously, was injected intrathecally.

The cerebro-spinal fluid showed no clot, and a cell content of 88 per c.mm., 80 per cent. being lymphocytes. Gram film, Ziehl-Neelsen, and cultures were negative. The Fehling reduction was present, and the globulin was increased (definite cloud with a saturated solution of ammonium sulphate). The albumin was less than 0·025 per cent. (Aufrecht), and the chlorides 0·702 g. per cent.

The cell content, Fehling's reaction, and relatively normal chlorides are compatible with poliomyelitis.

On the seventh day there were increased knee-jerks and ankle-jerks and a positive Babinski sign, but no knee- or ankle-clonus. There was some incoördination in the limbs on attempting to touch the fingers together. At 3 A.M. the patient developed œdema of the lungs, and at 9.30 A.M. she died. Permission for a post-mortem examination could not be obtained.

CASE 10.—A female, aged 28, went to bed on June 10th feeling well. She woke at 2 A.M. and vomited three times and her bowels acted frequently. She was very giddy on getting out of bed. Her pulse-rate was 120 and the pulse was "irregular." On the next day her temperature was 99°, her pulse-rate 120, and she felt sick. She had a severe headache, worse on moving. There was no stiffness of the neck muscles or nystagmus, and the hearing was unaffected. The cranial nerves, motor functions, and reflexes were normal. On the third day the temperature was normal, and the pulse-rate 100–120. There was no giddiness, but there was stiffness of the dorsal muscles of the neck on flexing the head, and tenderness over the cervical spines (? Kernig's sign positive). The patient was mentally alert and nervous. On the fourth day the temperature was 98° and the pulse-rate 90. There was slight stiffness of the neck, but otherwise she felt well.

Examination of the central nervous system revealed nothing abnormal. She returned home; headaches occurred frequently for some months afterwards, but there were no ill-effects 11 months later.

CASE 11.—A male, aged 11, on June 12th complained of feeling stiff all over, had a severe headache, wished to be left alone, and felt sick. His temperature was 103° and he looked flushed. Slight redness of the posterior pharyngeal wall was apparent. The cranial nerves, motor functions, and reflexes were normal. Next day he felt well and all stiffness had gone. His temperature was 100°. For 15 minutes during the morning he complained that his sheets and bedclothes were covered with spikes; he insisted on this and appeared frightened. The knee-jerks were only obtained with difficulty with reinforcement, but otherwise the central nervous system was normal. On the third day the temperature was normal, the throat was normal, and there was no headache. Nothing abnormal was discovered on examination of the central nervous system. The knee-jerks were easily obtained and were normal and equal.

CASE 12.—A male, aged 9¼, vomited on June 12th and had a temperature of 102° with acute follicular tonsillitis; the tonsils were much enlarged and the pharynx was red. He had no symptoms or signs related to the nervous system and no headache. He made a complete recovery. Cultures from a throat swab on serum yielded Gram-positive cocci, but no Klebs-Löffler bacillus. On blood-agar it gave non-hæmolytic streptococci and *M. catarrhalis*.

CASE 13.—A female, aged 8½, on June 13th had a temperature of 101·8° and complained of sore-throat. The tonsils were much enlarged and the pharyngeal mucosa severely inflamed. The central nervous system was normal on examination. On the second day the temperature was 102°. The tongue was furred. Sleep was broken and the child very restless. Next day the temperature was 99° and she felt sick. The central

nervous system was normal. On the fourth day the temperature was 101° and she had a nasal voice, but the palate moved well, and there was no regurgitation. Knee-jerks were obtained with reinforcement; otherwise the central nervous system was normal. Lumbar puncture was performed and about 5 c.cm. of clear fluid was withdrawn under normal pressure. Its cell content was 60 lymphocytes per c.mm., and no organisms or tubercle bacilli were found. The chloride content was gr. 0·72 per cent.; there was a trace of sugar and a faint cloud of globulin with saturated ammonium sulphate. The albumin was 0·025 per cent. On the evening of the fourth day the temperature was 99° and she was sleeping well, with no coughing. On the fifth day the temperature was 99° and she was much more comfortable. Her tongue was cleaner. On the sixth day the temperature was 98·8° and the voice was improving. There were no fresh signs in the nervous system. On the seventh day she left hospital and returned home. Her voice still had a slightly nasal character. She made a complete recovery.

CASE 14.—A male, aged 8, felt quite well on June 14th, but was seen to be flushed during a general inspection. His temperature was 100·4° and he had pharyngitis. Next day his temperature and throat were normal, and nothing abnormal could be found on examination.

CASE 15.—A female, aged 10, was taken ill with a sore-throat and a temperature of 102·4° on June 30th in Berkshire, after the school had broken up. She complained of headache and pain in the back. On the next day she was seen by her doctor at Newbury. She had a temperature of 102°; a sore-throat and stiffness of the neck muscles, but no head retraction. She complained of stiffness of the legs, though no change was found in the reflexes or muscle power. Nystagmus was noticed, and the voice was nasal in character. The palate moved well and there was no nasal regurgitation of food or fluid. By the sixth day the temperature was normal, and there was no pain or stiffness of the back or limbs. She made a complete recovery.

Note of the only other case occurring in the neighbourhood.—This case occurred ten days after the school had broken up, in a town six miles away, where several of the children lived. No connexion could be traced between them. These notes were obtained from the doctor who was in charge of the case.

On July 25th the child, a female, aged 11, did not feel well (? slight cold). Next day her temperature was 99° and her pulse-rate 100. She felt well, but had a slight cold and cough. The throat appeared reddened generally. The posterior neck muscles were slightly tender. At 8 P.M. the voice was nasal, but the palate moved well. The child choked several times during the night. Klebs-Löffler bacillus was not present in the throat swab.

On the third day she was unable to move her head from the pillow; she raised herself by rolling over on to the side first. She complained of some headache. The voice was definitely nasal in character and the left side of the palate moved poorly. Left facial paralysis developed. There was some stiffness and tenderness of the limbs and the knee-jerks were obtained with difficulty. The choking attacks were not severe, but occurred several times throughout the day. On the fourth day she had paresis of the left shoulder-girdle; the supraspinati and deltoid muscles were mainly affected and were tender.

After nine months recovery is complete except for slight weakness of the left labial muscles.

Diagnosis.

A diagnosis of bulbar poliomyelitis was made in Case 2 as a result of the clinical features which have been discussed, and this diagnosis was confirmed and the epidemic nature of the infection recognised about June 11th. Undoubted confirmation of this diagnosis could have been made by a histological examination of the brain-stem and cord, but permission for a post-mortem examination could not be obtained in the only fatal case. In view of the rarity of bulbar poliomyelitis and the unique character of this epidemic, it was thought necessary to confirm the diagnosis by some other means. The neutralisation test was therefore carried out with this object. The following short survey of the experimental pathology of poliomyelitis is given to justify the test as a method of diagnosis.

In 1909 K. Landsteiner and E. Popper transmitted the disease from man to monkey. Washings of the nasopharynx and an emulsion of the spinal cord were used for this purpose. The virus was shown to be a living organism by the transmission of the disease through a series of monkeys, the cord showing the typical changes of poliomyelitis in each case. This work was performed independently by Landsteiner and C. Levaditi in Paris, S. Flexner and P. A. Lewis in New York, and C. Leiner and R. von Wiesner in Vienna (1910). A. Netter and Levaditi (1910) and Flexner and Lewis (1910) showed that the intracerebral inoculation of active virus which had been incubated in vitro with convalescent serum was ineffective in causing the disease. The same virus always produced a fatal result in a few days if not so neutralised. It has been shown further by Levaditi (1920) that the immune bodies in the blood-serum of cases of poliomyelitis are specific to the virus of poliomyelitis. Neutralisation will not take place between this virus and serum from a case of epidemic encephalitis, meningo-encephalo-myelitis, or any allied disease. This work has been amply confirmed, and the neutralisation of the poliomyelitis virus by a convalescent serum implies that immunity has been developed by an attack of the disease or by contact.

The technique of the neutralisation test is well established and consists in mixing known volumes of virus emulsion with serum obtained from the convalescent patients. This mixture is incubated at 37° C. for two hours and then left overnight at 4° C. On the following day 0·5 c.cm. of the mixture is injected into the brain at a depth of half to one inch in the occipito-parietal region.

In the present investigations the virus employed was a very virulent strain (Fl.M.) which had been studied by R. W. Fairbrother (1929). The doses used for neutralisation were 100 times the minimal lethal dose for a monkey, which shows the severity of the test. It was not possible to investigate the whole school, owing to the difficulty and cost of obtaining monkeys, and the reluctance of a number of parents to allow blood to be taken for the test. The following Table gives the results of testing convalescent and abortive serum, also that from close and remote contacts. There are two saline and one human control in the series.

—	Saline.	Serum.	Virus emulsion.	Quantity of mixture injected.	Result.
	c.cm.	c.cm.	c.cm.	c.cm.	
Serum from Case 2 (convalescent) ..	—	0·8	0·2	0·5	0
Pooled serum from Cases 10, 13, and 15 (convalescent) ..	—	0·8	0·2	0·5	0
Saline control	0·6	—	0·4	0·5	*4 days
Serum from Case 1 (abortive)	—	0·6	0·4	0·5	0
Serum from brother of Case 2 (close contact)	—	0·6	0·4	0·5	0
Serum from brother of Case 15 (close contact)	—	0·6	0·4	0·5	0
Serum from remote contact in epidemic..	—	0·6	0·4	0·5	0
Serum from child joining school after epidemic (normal control)	—	0·6	0·4	0·5	*4 days
Serum from a day-boy at school during epidemic (remote contact)	—	0·6	0·4	0·5	0
Saline control	0·6	—	0·4	0·5	*4 days
Serum from another child joining the school after the epidemic (normal control)	—	0·6	0·4	0·5	0

0 = No infection.
* Infection (with the incubation period).

It will be seen that complete protection was given to the monkeys by serum from the convalescent children and by serum from the first case of illness

in the school. This child is therefore considered to have been an abortive case, an opinion which is confirmed by the epidemiological evidence. All the children examined had developed, as a result of their illness, antibodies which were capable of neutralising a virulent virus of poliomyelitis, and were therefore proved to have suffered from this disease.

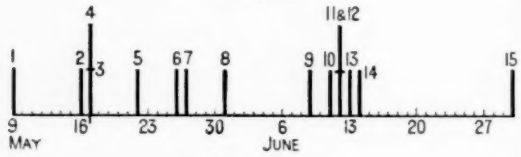
Four children were tested who were in no way ill during the term. Two were close contacts with the disease and two were remote contacts, one being a day-boy. These children were shown by the neutralisation test to have developed immunity. The contact immunity thus demonstrated supports the experimental work of F. W. Stewart and C. P. Rhoads (1929). They immunised monkeys by repeated intradermal inoculation of small doses of the virus without causing any detectable clinical disturbance.

Only two children were examined who did not come in contact with this epidemic at all; in one case the virus was not neutralised and the monkey died in four days, while in the other the serum neutralised the virus. The activity of the virus is usually controlled by incubation with saline instead of with normal serum, as some apparently normal people have acquired active immunity, probably by an unrecognised contact (H. J. Shaughnessy, 1930, W. L. Aycock, 1930).

Epidemiology.

It is generally recognised that poliomyelitis does not appear to any great extent in isolated communities, and in the epidemic form prefers to attack rural areas. It is therefore often impossible to obtain individual information as to the mode of spread. In this epidemic a small community was affected, and it was easier than usual to watch and report on the possible source of infection and the mode of spread and therefore to deduce the probable incubation period.

FIG. 1.



Incidence of cases.

Fig. 1 shows the manner in which the cases occurred during the epidemic, which was spread over seven weeks.

Case 1 lives during the holidays at a garage and often plays in the garage yard. No evidence could be obtained from his parents as to a possible source of infection among their friends or neighbours, and presumably passengers in a car which stopped in the yard brought the infection to the child, who was most likely to be playing there. On the first night of the term (May 8th) he slept in his dormitory next to Case 3; on the second night (May 9th) he slept in a small sickroom next to Case 2 who was in the sick-room with burns on his face (Fig. 2); on the first two days of the term he sat for meals next to Case 4.

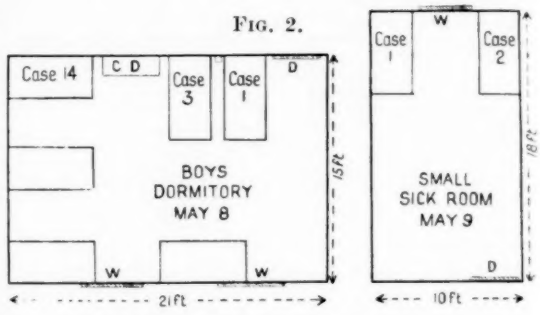
Fig. 2 shows the very close contact that existed during the first two nights between three of the four cases which occurred at the beginning of the epidemic. Not only did the children sleep in the same room but they slept in beds next to one another.

Further evidence of close contact playing a part in the spread of the disease is provided by the fact that the only adults to contract the disease were Case 4 and Case 10, who shared a room and were with each other during most of their free time.

Case 9 developed prodromal symptoms on June 9th and was isolated on that day. Case 13, who slept a few feet from her, developed prodromal symptoms four days later—on June 13th—and a palatal weakness on June 16th.

It is of interest that not a single case of illness occurred among the four house boys or among the

FIG. 2.



Position of beds on first two nights of the term.

children of the chauffeur or the garden boys, suggesting again that close association is necessary for spread to take place by contact.

The last case—Case 15—occurred 15 days after the school had broken up. Her brother was also at the school and went home with her. He was in no way ill during the term, but was shown by the neutralisation test to have derived immunity, and therefore to have carried the infection at some time for a sufficient period to induce the presence of immune bodies in the serum. The sister was either infected by the brother after returning home—which appears unlikely owing to the rapid loss of infectivity in poliomyelitis—or she was a carrier and succumbed to her own infection, or contracted the disease at school and fell ill after an incubation period of 15 days.

Convincing evidence of spread by carriers could not be found, nor would it be expected in such a localised epidemic, where every other child might be a healthy carrier. The usual external factors such as flies, dairies, water, and drainage were considered at the time without a full experimental investigation being made, as these methods had not then been considered.

Although evidence is brought forward to show that spread by direct contact probably took place in this epidemic there is considerable difference of opinion as to the usual mode of spread, and there are authorities that may be quoted in favour of spread by direct contact, spread by carriers, and spread by means of some external factor.

W. L. Aycock (1928 and 1929) and J. Calverly (1917) state that no doubt exists that spread from case to case takes place, and the latter gives a figure of 39 per cent. as the number of cases which contracted the disease in this manner in the Vermont epidemic. C. Kling denies the contact theory since, in his opinion, it is impossible to account for all the cases in this way. It seems probable that in the larger epidemics the abortive case is not sufficiently considered. If it were, it might not be necessary to cite methods other than contact.

S. Longhin and C. Aurian (1925) consider that carriers account for cases in which no direct spread can be traced. Wickman (1911) was of the opinion that carriers were capable of transmitting the disease, but he included

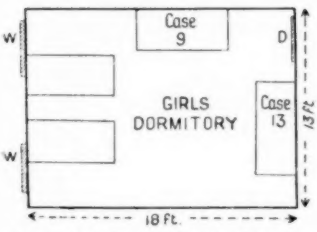
abortive cases in this group. Kling does not believe that carriers spread the disease, but excludes abortive cases from the group. He states that he has only been able to trace two authenticated healthy carriers in the whole literature. On the other hand, it is shown in this paper that many contacts derive immunity without being in any way ill, and therefore might be expected to take on the function of healthy carriers so long as the virus was present on the pharyngeal mucosa.

The evidence in favour of spread by an external factor is considerable, and such authorities as Aycock and Kling believe this to be a frequent method of spread, Kling favouring a spread by water and Aycock by milk. In the case of water-spread, by canals and rivers, it may be that abortive cases travelling in this way spread the disease more easily than the water itself. I. Wickman (1905), J. C. Dingman (1916), and Aycock (1927) quote series of cases of spread by milk, and the latter are most convincing, but neither Kling nor Levaditi has been able to demonstrate the presence of the virus in milk.

Information as to the *incubation period* can be obtained in some of the cases in the present epidemic by assuming the mode of spread to be by contact, as seems very probable from the foregoing description. Case 1 developed an acute attack on May 9th. Seven to nine days later three members of the school with whom Case 1 had been in particularly close contact developed the disease, one an abortive attack, and two with cranial nerve involvement. The incubation period appears to be seven to nine days in these cases.

Between May 30th and June 9th there was no fresh case, and, if Case 9 contracted the disease by direct contact, the incubation period would be at least nine days in this instance. Fig. 3 shows close contact between two cases. Case 9, the only fatal case, presumably infected Case 13 on June 9th. Case 13 succumbed to the prodromal stage of the disease on June 13th, which would point to an incubation period as short as four days.

FIG. 3.



A possible sleeping contact later in the term.

In Case 15, the last case to occur in this epidemic, it seems quite possible that the child became infected at school, developing symptoms 15 days later.

The *point of entry* of the disease is frequently held to be the pharynx, a theory which is borne out by the pharyngitis which was a constant feature of the present epidemic, and by the occurrence of poliomyelitis after tonsillectomy. Aycock and E. H. Luther (1929), investigating 1224 cases of poliomyelitis, found that 16 had developed the disease within one month of an operation for removal of the tonsils and that all of these had occurred between the seventh and the sixteenth days inclusive. I have records of two cases of bulbar poliomyelitis following tonsillectomy at 11 and 15 days respectively.

Summary.

1. The article reports an epidemic of poliomyelitis in which all the cases were either of the bulbar or abortive type. There was no spinal case in the epidemic.

2. The clinical features of the prodromal or abortive cases were not such that a sporadic case could be diagnosed. The most typical features were vomiting or nausea at the commencement of a feverish attack with a slight cough. Pharyngitis was present in every case; the child did not feel particularly ill and appeared to have recovered by the third day.

3. Bulbar involvement developed on the third or fourth day of the prodromal period. There was an increased cough and the child now looked ill and perhaps frightened. A cranial nerve palsy developed on the third to ninth day of the illness, though most usually on the fourth or fifth day.

4. The diagnosis was confirmed experimentally in monkeys by the neutralisation test. Control tests made were with saline and serum.

5. As a result of the experimental work the abortive cases and several contacts were shown to have developed immunity.

6. Evidence in favour of a spread from case to case is produced. The incubation period is shown to be seven to nine days in the cases in which a contact infection can be assumed.

My thanks are due to Dr. Donald Paterson for seeing several of the cases with me and confirming the clinical findings, and to Dr. A. E. Clarke Kennedy for his help and criticism in preparing this paper. Dr. R. W. Fairbrother and Dr. E. Weston Hurst, of the Lister Institute, made it possible for me to carry out the experimental work in collaboration with them, and gave me the benefit of their intimate knowledge of the whole subject.

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BIRMINGHAM HOSPITALS CENTRE.—The executive board announces that it proposes to give immediate effect to its policy "by bringing into existence, at the earliest possible date, as a first instalment of the whole scheme, a hospital unit of about 500 beds, with the necessary nursing block, auxiliary services and administration block, together with the reorganised medical school of the University, which is a necessary and integral part of the scheme." Sir Charles Grant Robertson, the chairman of the board, claims that the primary reasons why £625,000, about one-half of the cost, has been obtained in 18 months, and during a time of severe trade depression, is that the character of the scheme a new type of voluntary hospital, integrally and organically connected with a progressive medical school, appealed alike to the public imagination and reason, and that it aimed at giving Birmingham "something that no other city in Great Britain had or was planning to have." The estimated cost of the whole scheme is £1,244, 876, which gives a cost per bed of £1,482; for the hospital alone the cost will be £1252 per bed. The estimated cost of the first instalment of 500 beds is £702,000, or £1,404 per bed.

CLINICAL AND LABORATORY NOTES

GUMMA OF MEDIASTINUM.

By H. F. Joynt, M.B. Durh.

A man, aged 74, was seen by me on Feb. 9th, while I was visiting his daughter. He appeared to be a very hale and hearty man for his years. He came to consult me on Feb. 25th, complaining of blueness of the face (especially on stooping) and of inability to put his collar on. He gave a four days' history.

He had spent many years in South America. He had suffered for some years from cough and shortness of breath. Just under two years previously he had been operated on in the South of England for a tumour of the right testicle, as to the nature of which he was unable to give any information. He had a pain in his left leg just above the ankle which had been present for ten days. There was no dyspnœa or dysphagia.

The ears were permanently cyanosed, and the face as a whole was bluish, and became very blue on bending down. The neck was swollen in the lower part, especially at the sides. The venules visible in the epigastrium and along the edge of the ribs were not especially prominent. The pupils were equal and reacted to light and accommodation. The urine was normal. He stated that there was no pain in the chest. The percussion note was good over the chest and sternum. Respiration was normal except for tubular breathing just below the inner end of the right clavicle. The heart sounds were very indistinct, but there were no bruits.

Dr. J. J. Conybeare, who was called in, agreed that the patient had a tumour of the anterior mediastinum and that it was in all probability malignant. The swelling in the lower end of the left tibia was looked upon as another manifestation of that disease. The tumour of the testicle was thought to be the primary disease, though the time since operation was long. Radiography of the chest showed an opacity extending for an inch to the right of the sternum opposite the upper four inches. The tibia showed a central egg-shaped cavity without bony spicules. Later the Wassermann test was returned as strongly positive.

It was determined to put the patient on iodides and to increase the dosage rapidly, as an arrow shot at a venture.

On March 7th the right arm showed signs of œdema and the patient complained of occasional pains in the chest. On March 15th both arms were œdematous, and the right very tense. He had been taking over grs. 120 of potassium iodide daily for nearly a fortnight. His face was not so blue. On March 20th he had acute conjunctivitis in both eyes, but the dosage of iodides was not reduced. On March 22nd his cough was very troublesome. On March 25th his eyes were much better. He became dyspnœic if he moved his right arm, the œdema of which had spread to the shoulder. There was no alteration in the condition of the chest. On March 30th he had a sudden attack of dyspnœa, and was getting much weaker. Mucus in the trachea was very troublesome. The iodides were omitted. From this date until April 6th his condition was so precarious that the end was expected at any time. He had repeated attacks of cardiac failure with dyspnœa, and his mind wandered.

On April 6th, the condition of his right arm was noticed to be improved and the œdema of the shoulder was almost absent. From this day he steadily got better, iodides being restarted in small doses. All the œdema from his arms had gone by April 20th, the neck was less swollen and no blueness was present. Since then he has been given a course of acetylarsan and collosol iodine. In August he was able to roll his lawn, though he still became blue in the face on bending, and was somewhat short of breath.

Owing to various circumstances the pathologist's report on the tumour of his testicle was not received until early in May. Shortly it states: "No normal testicular substance. All tissue chronically inflamed. Some cells, which stain badly, thought to be new growth."

Beckenham, Kent.

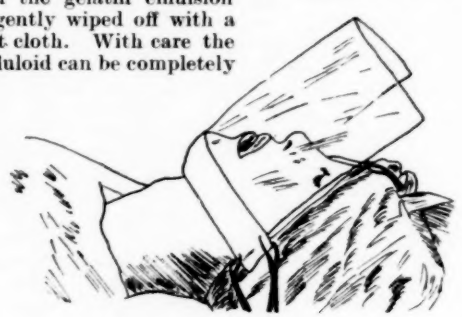
A SIMPLE FACE-SCREEN.

By Kenelm H. Digby, M.B. Lond., F.R.C.S. Eng.,
HO TUNG PROFESSOR OF CLINICAL SURGERY AND PROFESSOR OF SURGERY, UNIVERSITY OF HONG-KONG.

In operations upon the head and neck it is always desirable to shut off the more or less septic nose and mouth region from the operation area. Various methods are in common use, but they are not entirely satisfactory.

An ideal face-screen must be easily applied, and it should be capable of adjusting itself with changes in position of the head and neck. It should be impervious to watery fluids, and it should not interfere with a clear view of the face, by the surgeon as well as by the anæsthetist. This note describes a simple face-screen which in our experience has fulfilled these requirements.

An old celluloid X ray film is soaked in boiling water to which a little washing-soda has been added and the gelatin emulsion is gently wiped off with a soft cloth. With care the celluloid can be completely



cleaned without being scratched. The sheet of celluloid is then cut to form screens of convenient sizes, a larger one 12 in. by 7 in. and a smaller one 7 in. by 6 in. To one of the sides of the screen a strip of stout cloth 2 in. broad is attached, either by celluloid solution in amyl acetate (or in acetone), or else by machine stitching, or hand sewing. The cloth edge enables the celluloid sheet to be secured firmly to the towels, especially the one previously clipped round the patient's head. It is easy by using four clips to bend the thin celluloid sheet so that it stands well away from the nose and mouth. The accompanying illustration shows the screen applied for any operation upon the neck.

The celluloid is inflammable and should not be used if a cautery or diathermy is to be employed. The screens can be sterilised by boiling for ten minutes in water. After being sterilised several times the celluloid begins to become opaque and fresh celluloid must be used.

Celluloid is composed of nitrocellulose and camphor and is very slowly hydrolysed by boiling water with the production of free acid. This makes it advisable to sterilise the screens apart from metal instruments. It also makes their sterilisation in an autoclave

inadvisable, for the acid rots the fibre of the cloth towel in which they are wrapped, and even carbonisation may occur when they are placed in drums.

I am indebted to Prof. G. T. Byrne, of the Chemistry Department of Hong-Kong University, for the preceding information as to the chemistry of celluloid. I am also indebted to Mr. H. Leong for his help with the drawings.

A CASE OF ATHEROMA IN THE PULMONARY ARTERIES.

By G. Arbour Stephens, M.D., B.S., B.Sc. Lond.,

CONSULTING CARDIOLOGIST, KING EDWARD VII. WELSH NATIONAL MEMORIAL ASSOCIATION; CONSULTING PHYSICIAN TO CARDIGAN AND DISTRICT MEMORIAL HOSPITAL.

Ali Baba, aged 51, a native of the Malay Peninsula, who had worked for several years as a ship's cook, died on Nov. 15th from œdema and cardiac failure.

History.—He was first admitted in 1923, complaining of cough and shortness of breath, and was treated for bronchial asthma. After that time he has been in and out of the wards very frequently, complaining of chest, stomach, or head. The last admission was nine months ago, when his chief trouble was shortness of breath. He complained of poor nights on account of the breathing being more difficult than in the daytime, and nearly always had a feeling of oppression over the left chest, and one of considerable discomfort over the splenic area. On examination the breath sounds were weak, but without râles or rhonchi. There was no hæmoptysis or expectoration. The heart seemed slightly enlarged; the heart sounds were *weak* and there was no murmur. The weakness of the heart sounds is extraordinary in view of the tremendous development of the ventricular muscles discovered at autopsy. If the muscles of the heart cause the heart sounds, they ought in this case to have been exceedingly well marked!

The pulse was always regular, but he was more or less cyanosed. Abdominal examination did not reveal anything abnormal, and the spleen could not be felt. The Wassermann reaction was negative, and the blood pressures were systolic 170, and basic 70 (normal by my method being 150/50).

The diagnosis was extremely vague, for both signs and symptoms were not characteristic of any special disorder, but it was thought that a tumour in the region of the heart might be responsible for the trouble. Treatment was mainly symptomatic, except that parathyroid extract was given to relieve the raised basic pressure, and for a time he was more comfortable.

Post-mortem examination.—Externally there was a considerable amount of œdema of legs and scrotum, and a certain amount of cyanosis in addition to his dusky hue. There were no pleural adhesions, and only a small quantity of fluid in the pleural cavity. The negative pressure had disappeared from the pericardial cavity, and no excess of fluid was present.

The heart was considerably enlarged owing to hypertrophy of both the right and left ventricular walls, the former being ¾ inch thick and the latter 1 inch. Both walls were firm and dark red in colour, and only the tricuspid valve was affected, being considerably thickened. The trabeculæ carneæ and papillary muscles of the right ventricle were very well developed. There was a fair amount of atheromatous degeneration of the aorta extending to the upper half of the thoracic part, but not much pitting or calcareous degeneration.

The upper portions of both lungs showed a certain amount of emphysema, whilst the lower portions were congested and slightly œdematous. On section the lungs were tough and fibrous, but the most striking feature was the prominent way the cut ends of the dilated atheromatous intrapulmonary arteries stood out. These arteries were considerably dilated, and on slitting were found to have developed a large amount of atheromatous tissue in the form of yellow plaques.

The spleen was contracted and its cortex markedly wrinkled; its cut surface was congested, and the organ was firm and tough. The kidneys were fairly healthy, although there had been periodical appearances of albumin in the urine.

These cases are not common, as Dr. D. C. Hare and Dr. J. M. Ross have pointed out in their interesting survey (The Lancet, 1929, ii., 806). They drew attention to the increase of blood pressure in the lesser or pulmonary circulation, a fact which seems to deserve attention as showing that the basic pressure varies in the several parts of the body.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF NEUROLOGY AND SURGERY.

At a joint meeting of these sections, held on Dec. 2nd, the chair being taken by the President of the Section of Surgery, Mr. C. H. Fagge, a discussion on the diagnosis and treatment of

Acute Head Injuries

was opened by Dr. George Riddoch. Everyone would agree, he said, that injury to the skull was unimportant compared with intracranial complications. Contusion was the most common injury. Concussion had been defined as a condition of widespread paralysis of the functions of the brain coming on after a blow and tending to recover spontaneously. The theory of cerebral anæmia probably explained it best. Sometimes complicated movements, such as playing football, might be carried out after the injury without any memory afterwards. If breathing were arrested—presumably from bulbar anæmia—artificial respiration might keep the patient alive. A blow on the occiput was more likely to produce bulbar concussion than a blow on the vault. The three essential diagnostic features were the absolutely instantaneous onset, the paralytic symptoms, and the tendency to spontaneous recovery. It was doubtful whether any save very mild cases recovered without some organic damage to the brain.

The only essential difference between contusion and laceration was the degree of hæmorrhage. Local contusion might accompany slight concussion, but severe concussion was probably always accompanied by multiple contusions, which prolonged the period of symptoms. The slow recovery might be due partly to œdema and partly to neural inhibition. An abnormal state of health might persist for a considerable time, as manifested by symptoms at one time regarded as neurotic. Headaches might be due to high intracranial tension; these were "bursting" and brought on by emotional disturbance, lying down for long periods, reading, and bright lights. The cause was probably œdema, and there was a high tension of cerebro-spinal fluid on lumbar puncture. Or headache, in a small number of cases, might be due to hypotension, disappearing when the patient lay down, associated with low cerebro-spinal tension. Possibly the choroid plexuses had been damaged and produced cerebro-spinal fluid less rapidly than normal.

The later symptoms included headache, giddiness, minor mental disorders, insomnia, and irritability. Gross mental disorder was uncommon, but was different from the common minor mental disturbances in degree only. There were often no demonstrable physical signs, but these were commoner than was supposed; pupil changes or alteration of the senses of smell and hearing might well be missed if not carefully sought. Other ocular signs might be present, especially in the early stages. Parkinsonism

was rare, but interesting. The presence of convulsions was no indication that later there would be fits. Cerebral damage was often only a precipitating cause in epileptic subjects.

For treatment the surgeon and neurologist should combine, but surgery played little part in early treatment. The patient should rest for a week or ten days, but this might not always be possible. When consciousness had returned lumbar puncture was advisable, to ascertain the pressure and see if there was blood in the fluid. If pressure was high the patient should sit up; if normal, the head and shoulders might be raised. Intracranial pressure could be lowered by posture, drainage by lumbar puncture, dehydration by hypertonic solutions, and decompression. Dr. Riddoch thought dehydration safer than puncture, but rectal injections should not be repeated more than twice daily. Magnesium sulphate was twice as effective as sodium chloride for this route. Dehydration had superseded decompression except when tension was due to bleeding. Intracranial pressure might be raised by the recumbent position and by hypotonic intravenous injections.

Morphia should not be used; bromide and chloral were safer. Complete rest must be insisted on for three weeks in moderate cases where there were some symptoms of contusion. Activity should be carefully regulated during three or four weeks of convalescence, as neuroses were apt to sprout.

THE HISTOLOGICAL PICTURE.

Mr. GEOFFREY JEFFERSON declared that in all head injuries serious enough to call for treatment in their acute stage there was a fundamental, histological, state of contusion, in which compression might or might not be present; on top of this state there were epiphenomena, especially gross hæmorrhage, meningitis, and palsies; and that any patient admitted unconscious might be assumed to have widespread neural damage. The exact nature of concussion was a futile subject of debate. It was certain that patients who remained stuporous after a head injury had suffered contusion—a general contusion of the whole brain. This was accompanied by punctate hæmorrhages in some degree—though not so widespread as was often supposed; they were usually limited to the poles and the neighbourhood of the injury. High-power objectives showed marked œdema and blood-cells in the perivascular sheaths, which were often packed with blood. This blood had come from within the vessels by actual rupture. Concussion might play a part in this rupture by compression of the intracerebral and the intraventricular cerebro-spinal fluid. Mr. Jefferson had never been able to find signs of forcing of fluid into the bulb. If the patient did not recover consciousness in two or three hours it seemed that he must be compressed, but that this was not so was shown by the facts that cerebro-spinal fluid pressure might be low and that the effects of dehydration were not always good in stupor. In brain tumours, where compression could not be denied, the recovery on removal of œdema was dramatic; such a result was seldom seen in head injury, because then œdema was not the only cause. Yet the histological pictures of œdema were so striking that hypertonic solutions probably gave the best results; they were undoubtedly valuable, but should not be used unless the cerebro-spinal pressure were known.

Gross intracranial middle meningeal hæmorrhage was not nearly so frequent or important as was commonly believed. Subdural venous bleeding was commoner than extradural. Much more dangerous was acute subdural hæmorrhage, which could cause death as rapidly as bleeding from the middle meningeal.

A SERIES OF CASES.

Dr. RITCHIE RUSSELL described a series of cases investigated on a uniform plan in Edinburgh. Unconsciousness had lasted less than an hour in 80, one to 24 hours in 57, and over 24 hours in 47, while 16 had died. The higher functions of self-consciousness and control were the last to recover after a head injury. Retrograde amnesia lasted for varying periods, being longer in the severe cases, though even in these it was sometimes very short. The plantar reflex was not uncommonly extensor in the acute stage of severe cases. The neck muscles were often rigid. The cerebro-spinal fluid tension had been measured in 67 cases and the red cell count had been found to give an indication of the degree of hæmorrhage. Contre-coup injury was mainly due to the brain being torn from its membranes by it own momentum or inertia, the subarachnoid strands being torn and subarachnoid bleeding set up. In many cases the mental state was normal with a high pressure or comatose with a moderate pressure; headache usually accompanied high pressure, but had little relationship to the amount of blood in the fluid. Red and white cell count and protein content fell together to normal, the curve approximating to a straight line, unless there was a meningitis to cause fluctuation of the white cell count. Hyperglycæmia was present in the early days, and the sugar content of the cerebro-spinal fluid fell with the onset of meningitis.

The stage of cerebral irritation might be regarded as a stage in the recovery of consciousness. A certain increase of intracranial pressure was necessary to recovery; it should not be lowered unless excessive. It was important to control restlessness, and for this morphia could be given if the patient were allowed to recover for observation after each dose.

Mr. J. PATERSON ROSS mentioned three problems: the subdural hæmatoma; a local brain lesion with a low cerebro-spinal fluid pressure; and operation for depressed fracture. He stressed his difficulty in recognising the atypical subacute subdural hæmatoma, and described two cases. The condition was commoner than was believed and should not be forgotten. Intracranial hæmorrhage was the most natural diagnosis of paralysis after head injury, but had been ruled out in a case which Mr. Ross described, because the cerebro-spinal fluid pressure had been low. The boy had improved without operation; presumably the lesion had been laceration by contre-coup. Depressed fracture certainly called for operation when there was a penetrating wound but not always in other cases. Operation was not an essential prophylaxis against epilepsy. The dura was usually left intact if undamaged, but it was improbable that mere elevation of the bone would benefit generalised contusion.

DISCUSSION.

The PRESIDENT thought that the stressing of cerebral rather than cranial injury was a great advance in teaching. He had understood that lumbar puncture was not without danger and asked if there were any contra-indications. He could supply several cases of depressed fracture treated conservatively, with uniformly good results.

Mr. JULIAN TAYLOR asked what "commotion" was, if Mr. Ritchie Russell's theory be accepted, and quoted a case where œdema and cerebral irritation had disappeared after decompression. Subdural hæmorrhage was best diagnosed by boring on either

side of the falx and seeing what came out. Treatment was very difficult; the larger the lesion and the more slowly it grew, the greater the urgency of operation. The second attack of coma might kill the patient. In acute cases a waiting attitude might be adopted. Patients with subdural hæmorrhage were usually rather ill after operation, and might show cerebral irritation. The bone flap might be lifted by œdema.

Mr. DONALD ARMOUR asked what was the underlying basis of photophobia after head injury, when it was an isolated symptom, and referred to two cases.

Dr. C. P. SYMONDS pleaded for a uniform terminology for the clinical states. Surgeons retained the term "cerebral irritation"; which was also called "cerebral contusion," traumatic stupor, and traumatic delirium. A clinical was better than a pathological label, as little was really known of the pathology. A careful observation would convince anyone that increased intracranial pressure, as seen in tumour, for instance, was different from traumatic stupor; the motor restlessness and delirium were not seen. The basis of traumatic stupor, if not pressure, must be some direct damage to the neural tissues. The neuropathologists should investigate the histology of these cases in greater detail. Very widespread changes in cells and myelin had been described and might well account for the clinical picture. Treatment, in this case, would go back to the time-honoured rest and sedatives, notably morphine.

Dr. RUSSELL BRAIN said that hypertonic solutions lowered intracranial pressure in several ways; by lowering production and increasing absorption. Mr. Jefferson's sections had shown the deficient absorption in the distended spaces. It seemed doubtful whether it was wise to try to promote absorption by damaged channels and so increase the strain on them.

REPLY.

Dr. RUSSELL said he had not the least idea what "commotion" was, but suggested that loss of consciousness was due to a jar, possibly a molecular damage.

Mr. JEFFERSON said that the withdrawal of fluid by lumbar puncture from a deeply stuporous and cyanosed patient was likely to be disastrous, unless the pressure were known. He described a case of extradural hæmorrhage associated with a low cerebrospinal fluid pressure; but the patient had not at once improved after operation because there was in addition an underlying contusion of the brain.

Dr. RIDDOCH observed that our knowledge of head injuries was even now imperfect. Vascular causes by no means formed so important an explanation of clinical phenomena as had formerly been supposed. There was actual organic structural change to the nervous tissue itself. The clinical characteristics of the headache after the first stage was over were important diagnostically. He thought irritability would have been present in Mr. Armour's cases of photophobia.

SECTION OF ORTHOPÆDICS.

AT a meeting of this section on Dec. 1st, with Mr. HARRY PLATT, the President, in the chair, a paper on the

Effect of Wearing High Heels

was read by Mr. P. B. ROTH. He had found it, he said, a difficult subject to investigate, because it was surrounded by prejudice. He regarded as "high" a heel which measured 2 in. or more from the ground to the top of the heel. Probably more than two-thirds of the civilised women of the world wore high-heeled shoes. A very large firm of manufacturers gave the following proportions of high and low heels: $2\frac{1}{4}$ to $2\frac{3}{8}$ in., 23 per cent.; 2 to $2\frac{1}{8}$ in., 46 per cent.; $1\frac{7}{8}$ to $1\frac{7}{8}$ in., $20\frac{1}{2}$ per cent.; flat—i.e., 1 to $1\frac{3}{8}$ in.—10·2 per cent. On this basis 69 per cent. of the shoes had high heels. Asked for reasons, most women said that high heels made the feet look smaller, they looked smarter, and were fashionable. All declared them to be much more comfortable than flatter heels, especially in standing. Mr. Roth set out to find an explanation for this universal declaration of comfort. Objectors said that high-heeled shoes projected the weight of the body on to the foot in such a way as to force the foot into the toe or front of the shoe, causing hallux valgus, bunions, hammer-toes, corns, and callosities; further allegations were that the high heels caused stooping, round shoulders, scoliosis, and visceroptosis. Mr. Roth's investigation included an examination of the mechanics of the foot, inspection of the skeleton, radiography of the foot, inquiry from wearers, and observation of wearers.

The body-weight was, he said, carried down the tibia to the astragalus, and so distributed to the foot. With the tibia vertical, as in standing, two-thirds of the weight passed into the os calcis, a third into the metatarsal bones; this could be proved in a simple experiment with the standard weighing machine. Examining laterally by means of X rays the standing foot, it was seen that the bones took the form of an arch; they touched the ground only at two points—at the heads of the metatarsal bones in front, and at the posterior end of the os calcis behind. They were kept in this position by ligaments and muscles, and the weight of the body was continually pressing down on the arch, tending to flatten it out; consequently these ligaments had to withstand considerable strain, though this was not obtrusive except on long-continued standing and walking, or on resuming walking and standing after an exhausting illness. When a high heel was placed under the foot the horizontal position of the os calcis had entirely changed its manner of transmitting the body-weight to the ground, for it now did so throughout its whole under surface, instead of by its posterior extremity only. The os calcis was receiving support through its centre. Wearers of high-heeled shoes, when asked, all said the pain they felt when first putting them on, before becoming accustomed to them, was to the front of the under part of the heel. The impinging of the weight on the whole extent of the os calcis must effect a great saving of ligamentous and muscular strain; hence, possibly, the universal statement that high-heeled shoes gave more comfort than those with low heels. The movement backwards of the tibia had the effect of transferring its weight further back, so that one-third of the weight of the body was still distributed forward to the metatarsals, and two-thirds of it backwards to the os calcis. When a shoe with a very high heel—i.e., $3\frac{1}{4}$ in.—was worn, the os calcis became tilted down in front, the tibia having moved backwards on the astragalus almost to its posterior limit, and it was still placed vertically. The same proportion of weight still went into the heel and was being distributed over the whole under surface of the os calcis. He could give no credence to the idea that a high heel caused alterations in the spine and abdominal viscera, for if the tibia remained vertical, whatever the height of the heel, anything above the tibia would not be affected.

With regard to the effect of the high heel when walking, he had to rely on what was stated by a very

large number of women, checked by what was learned in regard to the standing foot. For a heel of no more than moderate height—i.e., about 2 in.—these shoes were more comfortable than flatter heels, provided the ground was fairly smooth; but if the ground was irregular, or fairly soft, it was better to have a somewhat lower heel. In a women's walking race to Brighton from London a few years ago the winner wore her ordinary high-heeled shoes.

In conclusion, Mr. Roth said he had not been able to find evidence of any harm resulting from high-heeled shoes; the supposed sequelæ of such high heels—stoop, scoliosis, visceroptosis—were baseless, for children and men had them equally. A more likely cause was badly fitting footwear. Mr. W. H. Trethowan had said that the most important measure in giving relief in cases of weak or overstrained feet was to raise, not lower, the height of the heels worn. Also, a high heel was often used in cases of shortened limb, and in cases of shortened tendo Achillis a high heel was preferable to a tendon-lengthening operation. A high heel also relieved flat-foot. A 2 in. heel was, he declared, a valuable mechanical contrivance, and there was no reason, other than custom, to restrict it to one sex.

Miss M. S. JEVONS expressed her agreement with Mr. Roth's contentions; the only objection she could see to the high heel was when patients bought cheap shoes, in which the heel was so slanting downwards that, though the os calcis had been made horizontal, the whole foot slipped forward. This was likely to produce hammer-toe and corns.

Mr. RALPH THOMPSON said some people, chiefly men, walked with a tilting forward of the body generally, with an increased extension of the foot as it was brought forward. He had seen it in only two women. He agreed with Mr. Roth.

Dislocation of the Atlas.

Mr. R. WATSON JONES read a paper on Pathological Dislocations of the Atlas and their Treatment. It was written, he said, as a result of two cases in his own practice. It was now 101 years since Sir Charles Bell described a man with a deep ulcer on the back of the pharynx who had a dislocation of the atlas because the ulcer had destroyed the transverse ligament of the atlas. Fourteen other cases of the kind had since been reported. The condition was almost restricted to the first decade of life; only three of the patients were over 11 years old, and from 7 to 11 was the usual age. No traumatic factor could be determined; the dislocation took place quite spontaneously after a normal movement of the head. In one of his two cases it occurred before an operation for acute mastoid disease; in the other the child was playing by himself in bed. The predisposing factor was an inflammatory lesion in the upper region of the neck, but any infection which was accompanied by hyperæmia in the region of the base of the skull might cause the dislocation: tonsillitis, pharyngitis, middle-ear disease, mastoid disease, inflamed cervical glands. The particular kind of organism present did not seem to be material. When a child had this condition, head movements were avoided, and the head was carried tilted towards one shoulder; it was the posture found in ordinary torticollis, but there was no shortening nor spasm of the sternomastoid. Any attempt to move the head was strongly resisted. There was no tenderness over the cervical vertebræ, but percussion caused pain. In none of the cases which survived was there evidence of an irritative lesion of the cord, but the cord was lying in a very restricted space between the odontoid and the back of the foramen magnum. The anterior arch of the atlas might show decalcification. Treatment was by recumbency and head extension; in many cases prolonged fixation had been necessary, even up to six months.

Mr. GEORGE PERKINS spoke of a patient in a hospital, a youth of 20, with a pathological dislocation of the atlas. He had an attack of supposed influenza, and while lying in bed his neck was stiff. After recovering from the influenza he could not use his right hand well, then there was disability in his left hand. A month or two later he was unsteady on his legs, and finally was unable to walk at all. Radiograms of the cervical spine showed complete dislocation of the atlas on the odontoid process; there seemed to be no decalcification of the atlas. He had now been treated for a month by head traction and was recovering in both legs and arms.

Mr. H. J. SEDDON referred to a patient with Still's disease in 1926 who had a spontaneous dislocation between the axis and atlas, and later had paralysis of all four limbs. He was treated by traction, and completely recovered with heteroplegia. That dislocation was certainly spontaneous. A radiogram taken early this year showed ankylosis between the axis and atlas.

Arthroplasty of Elbow-joint.

Mr. R. C. ELMSLIE gave a cinematograph demonstration of an operation performed by him for this condition. The patient, a young woman, had an operation on the elbow eight years before on account of tuberculous disease, and as a result she had ankylosis of the right wrist and forearm, with consequent serious disability of her right hand and greatly restricted movement in the right shoulder. The case was therefore one of polyarticular arthritis. The operation consisted of exposure of the elbow by a posterior incision, splitting of the triceps into a superficial and a deep half to facilitate subsequent suture, and stripping of the joint at the inner and outer sides. The lower end of the humerus was divided transversely at the level of the epicondyles, and the extremity was bevelled off to a fine edge. The ulna was then divided by a saw-cut parallel with the surface of the olecranon, and a cross-cut parallel with the greater sigmoid cavity, thus leaving part of the olecranon intact. The lower end of the humerus was covered with a fascial flap, and then the muscles were sutured. The remarkable range of movement of the arm after the operation, with a 4 lb. weight in the hand, which the moving picture showed, was confirmed by demonstration of the patient.

Cerebral Diplegia.

Dr. REDVERS IRONSIDE read a paper, supplemented by a cinematograph demonstration, on Cerebral Diplegia: Its Classification and Prognosis. He said that symmetrical diplegias formed the largest part of infantile palsies. The brain and spinal cord of these cases had apparently been normal, as viewed by the naked eye. The commonest condition found at autopsy on these cases was atrophic sclerosis, the convolutions being shrunken, with evidence of neuroblastic death and secondary gliosis. The tracts might be poorly developed; the cells of the bulb and mid-brain might be affected. The distribution might be scattered, and then the changes predominated in the prefrontal lobes or the temporal lobes, producing mental defect, even blindness. In its diffuse form, atrophic sclerosis produced the condition known as

"walnut brain." Dr. Ironside divided the cases into (1) cortical types (symmetrical); (2) striatal types (symmetrical); (3) cortico-striate types (sometimes symmetrical); (4) cerebro-cerebellar types. Transitional cases might also be seen. He had not found any dependable relationship between the physical failure and the mental failure. These children varied greatly in the degree of persistence with which they pursued anything. The prognosis in any given case depended on the physiological residue of power which a careful assessment revealed. Orthopædic treatment was important, and he advocated a closer discussion over these cases between the neurologist and the orthopædic surgeon.

BRITISH INSTITUTE OF RADIOLOGY

INCORPORATED WITH THE RONTGEN SOCIETY.

THE Annual Congress of this Institute was held from Dec. 2nd to 4th, at the Central Hall, Westminster, under the Presidency of Dr. A. E. BARCLAY. It was officially opened by Lord RUTHERFORD, who spoke on the origin of the gamma rays, which were, he now thought, derived from the motions of alpha particles in the nucleus and had nothing to do with the beta rays.

A cinematograph film by Prof. F. HAENISCH (Hamburg) followed, showing experiments on the inflammability of films.

Sir JAMES JEANS then delivered the fourteenth Silvanus Thompson Memorial Lecture on

What is Radiation ?

He described radiation as a shower of discrete photons —or bullets—each carrying energy and momentum. The theory of relativity had brought the fundamental corollary that all energy had mass associated with it. A disturbance of a single atom produced one complete photon and one only, and the loss of mass of the atom was exactly equal to the mass of the resulting photon. When the disturbance caused a rearrangement of the outermost layers of an atom only, the resulting change of mass was only a few millionths of the mass of one electron and the photon had the wave-length of light. If the disturbance caused rearrangement of the inner electrons of the atom the result was X radiation, and the photon had a mass about one-ten-thousandth of that of an electron. The photons of the most penetrating radiation known had a mass about equal to that of an atom of helium. Photons might be looked on as bits of energy which had broken loose from the electric charges of the universe. They were not simply bullets, but had also wave-like properties. Their motion was unhampered by the retarding effect of an electric charge that caused electrons and protons to move always at a speed less than that of light. The sun distributed photons through space at the rate of over four billion tons a second, but the electric light companies charged £17,000,000 an ounce for them. Were it possible to annihilate matter, an ounce of it could be turned into an ounce of photons.

The second session was devoted to technical physical papers on advances in X ray engineering, economy and quality in radiology, the X ray emulsion, the power factor in radiography, and experimental radiography with gamma rays. Dr. R. G. Canti's film showing the effects of radium on living tissues cultivated in vitro was shown.

The Twelfth Mackenzie Davidson Memorial Lecture was delivered by Prof. HANS HOLFELDER (Frankfort-on-Maine), who took as his subject a comparison of

Medical, Surgical, and Radiological Conceptions

in relation to the treatment of disease. Surgical conceptions, he said, were almost entirely topographical and anatomical, rather than physiological and biological. Surgical prognosis was as definite as prognosis could be, and depended largely on the amount of radical treatment that was possible. Human life depended on the surgeon's control of bleeding and sepsis, and he operated as an artist, taking great responsibility and leaving relatively little to the organism itself. Surgeons looked for immediate results, and found it hard to understand why the radiologist must wait for weeks before deciding whether a growth would yield to his treatment. Close coöperation between surgeon and radiologist had greatly improved late results. Each must appreciate the other's position. The surgeon was a great artist, whom no one might contradict, and was the hero of the hospital.

Quite different was the physician, who had to study the diseased organism as a whole and every single organ and function, often by prolonged and complex methods. His work was much more contemplative, comparative, and detailed. He was the great sceptical observer, always realising how difficult it was to penetrate the veil that covered the diseased organism. He could never be satisfied with a symptomatic diagnosis. Disease had been described as obstruction in the gear-box, and this well expressed the complicated mechanisms involved. He was bound to take a somewhat negativistic attitude towards therapeutic results. The marvellous ability of the organism to recover without treatment and the absence of any effect from strong drugs had led to a therapeutic nihilism, which had been only slightly shaken by modern chemotherapy. Most remedies were altered or diluted by the body fluids before they reached their object. Therefore the physician realised how small a power he had to modify disease and must be less the man of quick activity than the man of critical judgment.

Radiological diagnosis, like surgery, went along topographical lines in many ways, but the function of the gastro-intestinal canal had been an early subject of radiographic study, which combined the powers of medicine and surgery and answered many special clinical questions. Modern radiographic diagnosis was a very scientific and artistic proceeding, demanding a thorough acquaintance with technique and with medicine. Radiotherapy had at first followed surgery very closely, but had only triumphed when it had learnt to differentiate the surgical points of special value to itself. It was by no means confined to malignant disease, though that was indeed its centre. The earlier methods had been very similar to surgical operations, with the aim of complete destruction, and the radiologist had been rather a physicist or technician. The modern radiologist mastered his Rontgen dose much as the surgeon mastered his knife, and would no more leave the control of his work to a technician or assistant than a surgeon would hand his knife to the nurse during an operation. Curiously enough, though, he could well leave the actual treatment to a technician; his great skill and care were required while the field was being localised, before the actual treatment dose was started. His work demanded much time and devotion. Radiotherapy combined the topographical ideas of

surgery and a complex technique into its own new method, and biological research and clinical observation had shown that the single "surgical" dose was less efficient than protracted dosage. His prognosis could not be as definite as that of surgery, as the result depended on the capacity of the organism to take advantage of the chance given it. Great clinical and radiotherapeutic experience was necessary for modern radiotherapy; it had become an essentially clinical method. The parents should realise that their child had now grown to manhood and must be given autonomy; full control of the patient.

At the third session, Sir THOMAS HORDER opened a discussion on the

Radiation Treatment of Leukæmia.

He urged the importance of coöperation between physicians and radiologists. The essential pathology of leukæmia still eluded workers; the two chief theories were the infective and the neoplastic. It was unhelpful to view it as a primary anæmia. He thought radiation acted indirectly rather than directly, but its mechanism was not really known. Its action was symptomatic rather than curative. Life was not greatly prolonged, but the patient's comfort could be greatly enhanced by skilful and well-planned radiation. Even if he felt quite well he remained potentially leukæmic. Its latency was one of the striking features about leukæmia. The aim of treatment was not a normal white cell count; the hæmoglobin and red cell count should be restored to normal if possible, but the important thing was the general condition. The leukæmic were not immune from the aplastic anæmia produced by radiation in the healthy. Re-treatment should not be given merely because the white cell count had risen, but only for general relapse. Recumbency had a remarkable effect on the blood count, and general therapeutic measures and rest are essential. The indication for re-treatment was a definite subsidence in the general state. On the whole, arsenic and similar drugs should be suspended during radiation treatment, and restored afterwards. Phenylhydrazine, benzol, and naphthaline tetrachloride were potent drugs and many patients were peculiarly susceptible to them. The danger signals in radiation treatment were pyrexia, myocardial weakness, renal insufficiency, and hæmorrhages. Acute lymphatic leukæmia was not suitable for radiation, unless there was some special pressure trouble; nor should radiation be given during acute phases of the chronic disease, or if Addisonian anæmia complicated the picture. Gout was a common complication, not related to radiation. A hard spleen was a great nuisance. When present thoracic radiation might be useful. Glands should be irradiated in any case for the patient's sake. This was a field for clinical research, and controls would be very valuable.

Dr. N. S. FINZI described the effect of radiation on cases treated by him. He thought that most people under-dosed leukæmia, because it was quite easy to kill with X rays and because much too much attention was given to the white count and too little to the red count. After a typical spleen dose (F.D. 24 c.cm; field 20 cm. diameter; Al. 5 mm.; 7 H = 378r = 85 per cent. of an erythema dose) the white cells fell rapidly, showed a secondary rise, another fall, and another rise. The red cells, on the other hand, after a small initial fall, rose fairly steadily, and the hæmoglobin with them. Radon solution had been tried in three myelocytic cases, with indifferent success.

The survival, of acute and chronic myelocytic cases together, showed an average of over a year; three had lived over three years and three over four years. The lymphatic type showed a survival from four days to five years, with an average of 18 months. The results seemed to be better in the myelocytic type. In the terminal stages patients might fail to respond at all to radiation. Even moribund cases were included in the statistics. Treatment of long bones had been discarded, as the effect of radiating the spleen was so much better. Improvement on radiating the lower chest was slower than that following treatment of the spleen. In the lymphatic type radiation would reduce the glands without greatly affecting the blood picture; again, treatment to the spleen was better. Great care must be taken not to give too big a dose to the glands. Irradiation of the whole trunk had given good results abroad.

The best results were obtained with large final doses and small initial ones. Heavier filtration and higher voltages seemed likely to give better results. Dosage should be controlled by frequent blood counts, the red count and the hæmoglobin being the determining factors.

Dr. A. PINEY described work based on the principle of treating as mildly as was compatible with obtaining results. Irradiation of the long bones and of the spleen had been used, and the results had been satisfactory. The full effect of radiation was not obtained right away, but the cell counts of the peripheral blood were not true indications of the state of the marrow. It was safe to reduce the white cells to approximately normal levels provided the decrease was mainly in the abnormal cells and not in the normal cells. In aleukæmic phases and cases the white cell count could be raised by repeated injections of sodium nucleinate.

Dr. J. H. DOUGLAS WEBSTER mentioned the great differences of pathological opinion on leukæmia. The acute cases were hopeless. A good deal of the effect of radiation was an indirect one; satisfactory results had been obtained by transfusion of irradiated blood and by applying radium to the feet. Possibly the effect was hastening the maturation of immature forms. Immature forms could not migrate, so they collected in the blood. Normal leucocytes were said to be found in the saliva in great numbers after treatment. The metabolic changes were interesting and had not been greatly studied. Dr. Webster described his results in 50 cases, ranging in age from 8 to 72. He thought the myelocytic type showed the most dramatic effects but that the end-results were better in the lymphatic type. The effect on the blood might continue for months after one course of radium. Radiation should be held in reserve until the patient began to go downhill. Radon had also been used, in tubes over the spleen. There seemed to be no great difference in the effects of the various X ray methods.

Sir THOMAS HORDER, in reply, emphasised the importance of being sure of the diagnosis before estimating results. The blood picture was not the disease but the indication of some disease much further back. A patient would not always respond to leucocytic stimulants, and it was therefore wise to be guided by the blood picture until a more reliable criterion was found.

Lipiodol in the Diagnosis of Intrathoracic Disease.

A discussion on this subject was opened by Dr. L. S. T. BURRELL, who said that lipiodol could be introduced nasally, orally, or through the crico thyroid membrane, and described the techniques.

The chief indication for lipiodol was bronchiectasis; it should be used before any operation of any magnitude. Treatment depended largely on the extent of the bronchiectasis, which was difficult to estimate clinically. Excision was a very satisfactory treatment if the disease was localised. Lipiodol was also useful for diagnosis in cases of hæmoptysis, and had saved many bronchiectatic and other patients from the sanatorium. It was less useful in lung abscess which it did not enter. It would often suggest the diagnosis of bronchial carcinoma. In pyopneumothorax lipiodol might be used to locate a perforation, but a little pepperminted air or methylene-blue inserted with a pneumothorax apparatus gave sufficient indication of the existence of a hole. Lipiodol was, as a rule, so harmless that it could be given to the most ill patients, but in pulmonary tuberculosis it sometimes caused an exacerbation rather like that produced by tuberculin. Iodine poisoning was sometimes seen, therefore lipiodol should not be used as a routine or indiscriminately. The chief contra-indication was when no benefit was likely to result from its use.

Dr. STANLEY MELVILLE said that chronic cough was no longer regarded as the important ætiological factor in bronchiectasis. Hæmoptysis was very often the only symptom. The initial lesion was commonly in the bronchial wall, often an ulceration. There was as a rule extremely little fibrosis; in fact the thinness of the bronchus was often striking. A large proportion of bronchiectasis might be congenital. His bias was strongly in favour of the crico-thyroid route for lipiodol. The risk of laryngeal spasm by the nasal route was not worth running. One injection was not enough to exclude bronchial dilatation. Dr. Melville showed a number of slides of lipiodol radiological investigations.

Dr. JAMES MAXWELL thought that the indications for lipiodol were getting fewer every year. The oral route had the disadvantage that the introducer could not tell where the lipiodol was going while he was putting it in. With the nasal method it could be put in while the patient was being screened, but the passage of the catheter was not always easy. The great advantage of the crico-thyroid route was its certainty, but the cannula might be pushed too far or not far enough. If air did not enter the syringe easily on withdrawal of the plunger, no injection should be made. The nasal route might prove later to be the method of choice. Before undertaking to use lipiodol it was important to test for sensitiveness to iodine and cocaine by giving potassium iodide and cocaine beforehand. Some other substance could be used for iodine-sensitive patients. The amount of lipiodol used should vary according to the nature of the case, from 20 c.cm. to 40 c.cm. If a blocked bronchus was suspected 5 to 10 c.cm. was ample to show the condition with no risk of collapse of the lung. In chronic empyema with sinus, lipiodol might be valuable to show broncho-pleural fistula, and should be used as a routine.

Dr. DUNCAN WHITE advocated oral injection, which was simple provided that the patient would coöperate with confidence. The success of the method depended on control of the tongue. The patient was first asked to breathe with his mouth open, then with his tongue protruded, and then with his tongue held by the operator. Lipiodol should be used in all cases of hæmoptysis, and to define the site of stenosis in carcinoma of the lung with atelectasis.

Dr. W. J. FENTON described the technique of the oral method, which, he said, depended entirely on the anæsthesia, which must be induced by a spray used together with a laryngeal mirror. Patients were quite contented. An assistant must hold the tongue. Dr. Fenton showed his electric laryngeal mirror which dispensed with a head-mirror. Some form of pressure was needed, and to avoid the difficulty of working a bellows he had designed an apparatus for utilising compressed air. He preferred a metal syringe because glass broke so readily. The injection could be watched the whole time by this method. It was easier if the patient was recumbent. The quantity of lipiodol should be small; 5 c.cm. was sufficient in a good patient lying down. Mere physical or radiological examination was insufficient to show bronchial dilatation. Lipiodol remained a little time in the trachea and there was no need to rush the patient to the examination couch. He objected to the nasal route because it was a blind method. After crico-thyroid injection patients complained of difficulty in swallowing for 24 hours, and there might be cellulitis of the neck, in unskilled hands.

Dr. J. V. SPARKS showed slides illustrating lipiodol injections and their advantage in diagnosis.

Dr. PETER KERLEY said that more than half of his cases of bronchiectasis in children lacked physical signs, and would have been missed but for lipiodol. It was better to do too many than too few lipiodol investigations. These children had been clinically diagnosed as chronic bronchitis or post-pneumonic fibrosis. There were three points in the differential diagnosis: (1) there was invariably persistent increased translucency due to compensatory emphysema in infantile bronchiectasis; (2) the diaphragmatic movements were usually better than those of post-pneumonic fibrosis and chronic bronchitis; (3) when a lobe was collapsed there was invariably a congenital basis for the bronchiectasis. The lobe was collapsed before it was bronchiectatic.

Dr. A. ORLEY justified the nasal method. He said laryngeal spasm was not so bad as Dr. Melville thought. The method was not blind, as the patient was put on the X ray table as soon as the catheter was introduced. Pictures should be taken as soon as possible to get a good outline of the bronchi, and every step of the procedure should be watched.

Future of the British Institute.

Dr. A. E. BARCLAY, in his presidential address, traced the history of the Institute and the increasing importance of its medical side. The object of the Institute should be, he said, to attract all users of radiations, but it was almost impossible to make a programme suitable for all. Sectional meetings offered a solution which had not, in fact, been favoured. Medical radiology in this country was crying out for opportunity. The Institute was now well equipped to teach the technical side of radiology, and its recognition as a training school was very important. Meanwhile it was hard to satisfy the needs of the physicist members; perhaps the Institute could specialise in one section of radiological physics. Dr. Barclay recommended the foundation of autonomous sections without any change in the constitution.

BETHLEM HOSPITAL: THE QUEEN'S PORTRAIT.—To commemorate the opening of the new Bethlem Hospital by the Queen, the Lord Mayor of London last week at a meeting of the Court unveiled a portrait of Her Majesty which has been presented by Lord Wakefield.

REVIEWS AND NOTICES OF BOOKS

The Nature and Treatment of Stammering.

By E. G. BOOME, M.B., Ch.B., D.P.H., Divisional Medical Officer, L.C.C.; and M. A. RICHARDSON, Senior Assistant, L.C.C. Stammering Courses for Children. London: Methuen and Co. 1931. Pp. 135. 3*s*. 6*d*.

IN the past stammering has been regarded as a separate entity, and has been treated purely from the vocal point of view, and all sorts of efforts have been made to re-educate speech as such. Where successes were achieved it appears to have been little understood that some other change was achieved in the child apart from the improvement in articulation. The authors of this book have had considerable experience in dealing with this painful disability. They outline the various theories of stammering, and discuss the different causes which have been made responsible for stammering, showing that many of these alleged causes are really accompanying symptoms or, at most, are provocations. They also point out what has only recently been learnt—that the stammerer has a temperament, or rather character. The facial signs of a stammerer, his tension, excitability, his emotional make up, and, above all, his sense of inferiority and isolation are well indicated; and, what is more, the stammerer's point of view is sympathetically considered. Their analysis of cases has brought home to the authors the importance of environmental factors, particularly the influence of the home, of the parents, and of brothers and sisters. With this insight into the tragic element in the stammerer's difficulties they are able to prescribe a catholic form of treatment which shall deal with as many as possible of the ætiological factors. The importance of relaxation and of ease—amounting to indifference—in overcoming tension, spasm, and excitability is fully realised; also the fact that a patient allowed to express his difficulties experiences that relief from tension which follows the solution of mental conflict. Environmental changes are recommended where these appear to be necessary. Dr. Boome and his collaborator have provided a very useful handbook on a disorder which is not uncommon, and the treatment of which, because of its irritating character, is often insufficiently persevering.

Emergency Surgery.

Vol. II.: *Thorax, Spine, Head, Neck, Extremities.* By HAMILTON BAILEY, F.R.C.S., Surgeon, Royal Northern Hospital. Bristol: John Wright and Sons, Ltd. 1931. Pp. 415. 25*s*.

THIS volume completes a work on emergency surgery, the first part of which has already been reviewed in our columns. The whole forms a reliable guide to those surgeons beginning their practice of emergency work, and will be found useful as a book of reference to the more experienced practitioner. The author has been happy in his selection of methods, and does not perplex his readers by numerous alternative procedures. There are of course some omissions, and some of the advice offered will not commend itself to every surgeon. For instance, there is no description of a really effective operation for draining the knee-joint, and only a mere mention of Orr's treatment, whilst, on the other hand, we find a full description of the Carrel technique which few surgeons now use. Intravenous injection of hypertonic saline for increased intracranial tension, which is here recommended, is usually held to do more harm than good when the first effect passes off, at which point it should be replaced by concentrated glucose solution.

Study of this concluding volume confirms our previous impression that Mr. Hamilton Bailey has written a reliable book on a very important aspect of general surgery. We congratulate him and his publishers, who have provided excellent reproductions, on the completion of his task.

Diseases of the Skin.

Eighth edition. By RICHARD L. SUTTON, M.D., Sc.D., LL.D., F.R.S. Edin., Professor of Dermatology, University of Kansas School of Medicine. London: Henry Kimpton. 1931. In 2 volumes. Pp. 631 and 1352 respectively. 52*s*. 6*d*.

THE seventh edition of this work, which appeared in 1928, has again been revised and enlarged. The author must have an inexhaustible fund of energy, for he has kept pace with the scope and compass of modern dermatology as it increases, as he says, "by leaps and bounds." The book has become world-famous, and in America at least must rival in popularity any other text-book on the subject. By printing more concisely the publishers have managed to keep the additional pages of text down to 65, but the number of illustrations have been increased by 53. There are 1290 illustrations in all and 90 coloured plates. It is an achievement for a "one man" text-book to record so completely and gracefully the science which only a decade or two ago was regarded as of small account in medicine, and in this country at least has only recently obtained university recognition. The illustrations especially are superb, being absolutely typical of the diseases they are claimed to portray. Another outstanding feature is the bibliography; the explanatory remarks show that the author is personally familiar with a large number of the publications cited. The text is, of course, reliable and concise, and although the style is not as dramatic and virile as that favoured, for instance, by the French school of dermatologists, the reader's interest will never flag.

Die Gesamte Kosmetic.

By MARTIN GUMPERT, M.D. Berlin. Leipzig: Georg Thieme. 1931. Pp. 228. RM.14.60.

THE removal of vascular or pigmented nævi, hypertrophic scars, keloid growths, hypertrichosis, warts, and unsightly scars forms a considerable part of the dermatologist's daily routine, particularly in private practice. The technique required for these procedures demands a degree of skill which cannot always be taught in hospital out-patient departments and which few text-books do more than touch upon. This is a serious and comprehensive synopsis of cosmetic treatment. The author presupposes a sound dermatological knowledge on the part of the reader. There is also a medical or pharmacological side to cosmetic arts, which are usually ignored by the practitioner, or despised as appertaining to the beauty parlour; this attitude is unfortunate, since it is likely to drive the patient into the hands of the charlatan. Dr. Gumpert provides a section on the principles underlying the composition of hair lotions,

soaps, ointments, pastes, emulsions, powder, rouge, cosmetic lotions, hair dyes, and perfumes, and does not scorn to touch on the mysteries of singeing and the "permanent wave," which, we are informed, was invented by Ch. Nessler in London in the year 1906. An entirely new industry for the manufacture of the complicated apparatus required is the direct result of this procedure, which demands of its acolytes a high degree of skill, experience, and responsibility. The physical cosmetic methods, which embrace electrolysis, ionisation, faradisation, diathermy, the galvano-cautery, CO_2 snow, and all the various rays, including "Grenz" or Bucky rays, radium, and X rays, are dealt with in a brief but masterly manner. Warnings are numerous; and it is satisfactory to read yet again that the use of X rays in hypertrichosis is unconditionally condemned. There is included, perhaps for the first time in a scientific dermatological work, a full description, with copious diagrams, of the art known in this country as "face lifting." It includes, of course, much more than this. Congenital deficiencies of the auricle, lymphatic hypertrophy of the lips, rhinoplasty, and the remedial measures for restoring a hanging breast—all these find a place in this comprehensive survey. The treatment of adiposity is not forgotten, and a final chapter of great interest is devoted to the psychopathic problems which frequently complicate the clinical picture, and may lead to a severe form of mental depression and even to suicide.

To have successfully compressed in so short a compass the principles and details of an art which is becoming increasingly essential in modern dermatology is an achievement of which the author may well be proud.

Diagnosis of Nervous Diseases.

Seventh edition, revised. By Sir JAMES PURVES STEWART, K.C.M.G., C.B., M.D., F.R.C.P., Physician to Westminster Hospital. London: Edward Arnold and Co. 1931. Pp. 730. 35*s*.

THE latest edition of Sir James Purves Stewart's well-known and much appreciated book on nervous diagnosis is somewhat larger than its predecessors—an inevitable consequence of contemporary advances in neurological theory and art. It has often been commended for its sound scientific basis as well as for its clinical merits and judicious selection of what is essential for the student and practitioner. The fact that a seventh edition is in demand remains the best proof of its outstanding value. Opportunity has been taken to recast several of the sections and to include certain recent modifications of accepted doctrine, as well as some topics whose importance is becoming better recognised, such as postural reflexes and disorders of sleep. Clearly printed on thin opaque paper, taking the illustrations well, the volume has not become either unduly heavy or bulky, and its present format is superior to that of some former issues. It is sure to be welcomed by a widening circle of students of neurology.

Gonorrhœa in the Male and Female.

Second edition. By P. S. PELOUZE, M.D., Assistant Genito-urinary Surgeon at the University of Pennsylvania. London: W. B. Saunders Co., Ltd. 1931. Pp. 440. 24*s*.

THE first edition of this book appeared in 1928. It was reprinted four times in the next two years, and now a second revised edition has appeared. Considering the plethora of books on the subject, it will be obvious that there must be something peculiar in Dr. Pelouze's work to produce this demand. This peculiarity is the fresh outlook brought to bear on the disease, built on real experience. The text is not burdened with references. One feels that the author is writing from his own cases, that he has thought clearly on what he is doing, and that he can give good reasons for his technique. The second edition differs from the first in that it also includes the disease as it shows itself in women. Here again the same refreshing heterodoxy shows itself.

This is not a text-book for the student who has to satisfy examiners. It is essentially one for the practitioner. The specialist, too, though he may differ from the author, will find ample material to interest him. He may be led to reconsider his own treatment, or forced to give reasons to himself for his faith in it.

The Tungsten-Titanium Arc.

Studies in the Photo-activity and Therapy of the Tungsten-Titanium Arc. By J. BURDON-COOPER, M.D., B.Sc., F.R.C.S.E., D.O., F.C.S., late Lecturer, Physiological Optics, Department of Ophthalmology, University of Oxford; and ARTHUR ROBERTS, T.D., F.R.C.S.E., M.R.C.S., Major R.A.M.C. (Retd.), Consulting Aural Surgeon. Bristol: John Wright and Sons, Ltd. 1931. Pp. 85. 10*s*.

THIS work is designed to supply information on phototherapeutic treatment by light derived from a composite electrode composed of pure tungsten, titanium, and chromium, the titanium content being between 1½ and 2 per cent. and the tungsten about 98 per cent., with a small but definite addition of chromium. Photographs taken by Mr. B. D. H. Watters, M.Sc., at the Middlesex Hospital, showed[1] little or no difference between the ultra-violet emission from such an arc and that of pure tungsten, and it was hardly to be expected that the clinical results would vary to any recognisable extent. This impression is strengthened by reading the illustrative cases given in the book.

Vertebrate Zoology.

An Introduction to the Literature on Vertebrate Zoology. By CASEY A. WOOD, M.D., LL.D., Collaborator, Division of Birds, Smithsonian Institution. London: Humphrey Milford, Oxford University Press. 1931. Pp. 644. £3 3*s*.

THIS imposing volume represents a vast expenditure of labour. It is "intended to assist students of vertebrate zoology and its bibliography, as well as university and other librarians, in securing a fair knowledge of an important branch of natural science." The work is divided into three sections. The first gives a brief account of the literature of vertebrate zoology, so far as it is represented in the libraries of the McGill University, Montreal, from the earliest times to the present. The second furnishes a convenient, short-title index of the same literature arranged geographically and in chronological order. The third section, the largest, is described as a "partially annotated catalogue of the printed books, periodicals, &c.," in the zoological collections of McGill University.

The author expresses the modest hope that this work will serve as a stopgap pending the appearance of a complete study and evaluation of the whole literature of vertebrates. It is certainly an effort which all students of this subject will appreciate.

[1] THE LANCET, 1928, ii., 278.

Arthur Conan Doyle.

By Rev. J. LAMOND. London: John Murray. 1931. Pp. 310. 10*s.* 6*d.*

THE volume makes an interesting addendum to Conan Doyle's own reminiscences, furnishing details in the life of a man of many sides. In some verses, which are reproduced here and which form the best of his published poems, he describes himself as soldier, priest and mystic, sceptic and thinker, and several other characters embraced within the extremes of "now a savage, now a saint." Mr. Lamond, in recording briefly the life of his subject from birth to grave, brings out the versatile capability displayed by Conan Doyle, but has been inspired chiefly by his championship of spiritualism. He appears to share Conan Doyle's own view, which he quotes, that his 30 years of literary activity, as well as his young man's agnosticism, formed a preparation for his work as a propagandist of the spiritualist movement. Mr. Lamond analyses the factors which led, in his opinion, to Conan Doyle's becoming a spiritualist, and recalls his early psychic studies. The second part of the book consists of little but a record of Doyle's interest in and work for the cause of spiritualism, and is well done as a piece of advocacy.

That Conan Doyle possessed the faculty of making all sorts and conditions of people not only admire him, but grow fond of him, emerges from these pages, and justifies the writing of the memoir.

"First Aid" to the Injured and Sick.

An Advanced Ambulance Handbook. Thirteenth edition. By F. J. WARWICK and A. L. TUNSTALL. Edited by F. C. NICHOLS, *M.C.*, M.B., Ch.B., Lecturer and Examiner, St. John Ambulance Association. Bristol: John Wright and Sons, Ltd. 1931. Pp. 276. 2*s.* 6*d.*

THIS book has held its place as one of the best-known books on "first aid" for 30 years. The thirteenth edition contains a valuable addition in the form of a glossary of words which may not be clear to the younger first-aid student. The book is compact, well illustrated, and has an excellent index. It should fulfil admirably the needs of students of first aid.

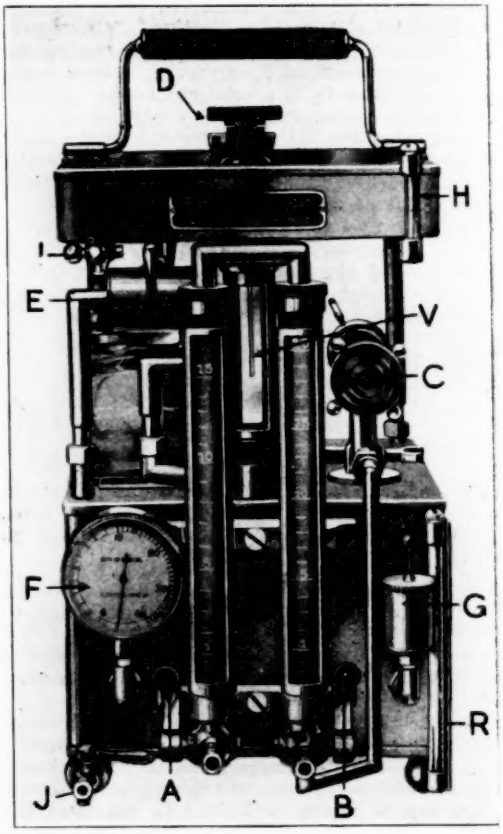
NEW INVENTIONS

APPARATUS FOR ANÆSTHESIA.

THE apparatus illustrated below has been devised to provide the maximum anæsthetic equipment in the minimum of space. No claim is made to originality in principle; the machine is in fact no more than a rearrangement of that designed by Dr. Ivan Magill, with the substitution of a gravity-fed drip for the ether as used on Shipway's endo-tracheal apparatus.

Nitrous oxide and oxygen are led in through the flow-meters B and A respectively. The mixed gases then pass the stopcock E, where they may be made partially or wholly to bubble through chloroform in the glass bottle. Next they pass into the lower chamber of the apparatus. This consists of an inner hot-water chamber around which they are conducted in a coil before being set free into the outer gas chamber. In the outer chamber the gases meet the ether drip which is controlled at D. The ether reaches the floor of the gas chamber through a vertical tube which passes through the hot-water chamber. V is a visible ether drip. In the hot-water chamber it meets the warmed gases and is thus vaporised and carried to the exit of the apparatus at the back, where it is available for the patient.

C is a CO_2 valve of a standard sparklet pattern and delivers CO_2 through the N_2O flow-meter. For use in hospital a tap is substituted which may be



connected to a large CO_2 cylinder. The ether is delivered by a gravity-drip feed from the upper chamber which is a reservoir holding one pound of ether. A glass gauge H conveniently indicates the level of ether and a tap I permits the ether to be drained off if required. F is a manometer which indicates the pressure in the outer chamber and G is a spring-loaded adjustable safety valve. The gauge R indicates the presence of fluid ether in the lower chamber. This occurs with a rapid ether-drip when the water has been allowed to cool. The excess ether may be removed immediately through the tap J. Another tap allows the pressure in the lower chamber to be conducted above the surface of the ether in the reservoir so that the gravity feed is effective at all pressures. There is an angled filler for the chloroform bottle which automatically closes the bottle when swung back into place. The chloroform bottle is insulated from the heat of the water by an asbestos mat.

The overall measurements are, front to back, 9 in., breadth 6½ in., height 11 in. The apparatus is made by Messrs. A. Charles King, Ltd.

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THE SPREAD OF POLIOMYELITIS.

PROBABLY poliomyelitis is usually transmitted by spray or droplets from the mouth or nose of infected subjects—cases or carriers. Some people put forward a strange modification of this hypothesis, and maintain that only carriers can transmit the virus, and that the clinical case of poliomyelitis is not infectious. The holders of this theory can never be proved wrong, because, unless a patient has never been in contact with any human beings except cases of poliomyelitis—which is absurd—anyone who has been near him may conceivably have been a carrier. Although it is impossible in any disease such as poliomyelitis, where as a rule the carriers and clinically unrecognisable cases form the vast majority of total infections, to prove with mathematical certainty in any specific instance that one person has directly infected another, yet enough evidence has now accumulated to satisfy most minds that an individual case is just as dangerous a source of the virus as an individual carrier. Owing to the great preponderance of carriers over cases, especially in urban districts, it is probable that in towns most poliomyelitis patients are infected by carriers, but this is not to say that, in suitable environmental conditions and among groups with a low herd immunity, a large amount of direct case-to-case infection does not take place. Instances of close contact between a pair of cases, like the one described by Dr. A. S. MACNALTY in our issue of Nov. 28th, and the evidence in the letter from Mr. WHITCHURCH HOWELL which we publish to-day, together with the well-known Swedish and Central European studies of the spread of poliomyelitis among scattered populations, and reports such as that of R. J. REECE,[1] who found more than one case in 11 out of the 18 houses which formed a Devonshire village, leave no room for any reasonable doubt that the clinical case of poliomyelitis can disseminate the virus. The outbreak of poliomyelitis in a small boarding school, which Mr. SCOTT BROWN reports at p. 1287, confirms this conclusion, and illustrates several other points in the œcology of poliomyelitis. All the clinically infected children in this school had a well-marked pharyngitis, and this agrees with the supposed mode of spread and portal of entry. Six of the eleven children who slept in three rooms contracted symptomatic infection in a way which strongly favoured the view that the virus was directly transmitted from case to case in the dormitories without interpolation of any carrier. The bulbar type of poliomyelitis has of late been growing commoner relative to the spinal form of the disease, and the fact that all SCOTT BROWN'S cases showed bulbar involvement illustrates the variation exhibited by different strains of the same neurotropic virus in their affinity for special parts of the central nervous system.

W. WERNSTEDT,[2] using the Swedish epidemiological data, gave the first clear demonstration that an epidemic of poliomyelitis latently immunises a large proportion of the community who escape clinical attack. Last year W. L. AYCOCK and S. D. KRAMER[3] confirmed this epidemiological deduction by direct experiment. Using the observation that the blood of many normal subjects renders the virus of poliomyelitis innocuous to monkeys, they discovered that such immune subjects were commoner in town than country. In fact, herd-immunity was directly associated with the prevalence of symptomatic infection. There is thus little doubt that, as in diphtheria, large numbers of people acquire active immunity to poliomyelitis by infection without recognisable symptoms. SCOTT BROWN found that four healthy contacts in his school had immune blood sera, while one of two children who joined the school after the epidemic was susceptible—which suggests that the epidemic had latently immunised most members of this school who had escaped clinical attack, and who had not acquired immunity earlier in their childhood.

It is instructive to compare this epidemic with the outbreak of poliomyelitis at Broadstairs,[4] the brunt of which fell on good-class boarding schools. AYCOCK[5] thought that this outbreak was caused by infected milk, but his conclusions were contested by other authorities, and as often happens, both sides may have been partly right. The virus was probably distributed through Broadstairs in milk, but once the infection gained a footing among the susceptible class of children in the schools, its further spread was likely to have taken place in the dormitories by direct contact. As in other infections which are usually droplet-borne, poliomyelitis may sometimes be spread by milk, and C. LEVADITI and his colleagues[6] suspect that butter also may be a vehicle of infection. But such modes of transmission probably account for only a very small fraction of total infections.

Owing to the large number of anomalous and unrecognisable poliomyelitis infections, the problem of prevention is exceptionally difficult. Nevertheless the reports of relatively extensive outbreaks in schools are sufficiently numerous, and the disease is so often followed by permanent disability, if not by death, that it is worth going to considerable trouble, and putting the whole herd to some inconvenience, if by doing so one or two cases of paralysis are prevented. One thing these school outbreaks teach is that *symptomatic* poliomyelitis appears to have a special tendency to spread in dormitories. Therefore patients suffering from this disease should not be allowed to

[1] Proc. Roy. Soc. Med., 1912, v. (Sect. Epidem.), 29.

[2] Ergebn. d. inn. Med. u. Kinderheilk., 1924, xxvi., 248.

[3] Jour. Prev. Med., 1930, iv., 189.

[4] THE LANCET, 1926, ii., 1070, 1085; Brit. Med. Jour., 1927, i., 113.

[5] Amer. Jour. Hyg., 1927, vii., 791.

[6] Bull. de l'Acad. de Méd., 1931, cvi., 245.

sleep in the same room with other children. On this principle it appears that—in contrast with some other infections, such as measles—many secondary infections of poliomyelitis might be prevented by disbanding a boarding school directly the first case was recognised. In such a case the parents of the returned children would have to be warned not to let them sleep in the same room as any younger children of the household. Although the efficacy and adequate supply of immune serum is still under investigation,[7] the time seems ripe for trying to give passive protection to the unaffected members of small but highly susceptible groups, such as we find in good-class boarding schools, when there is a chance of poliomyelitis becoming epidemic. Also it is obvious that the milk of such an institution should always be sterilised, and that all other dairy products should be beyond suspicion. During the prevalence of poliomyelitis all practitioners should suspect every febrile condition, remembering, as Mr. HOWELL points out, that much subsequent disability, and perhaps death, may be prevented by early orthopædic treatment. Moreover, serum ought to be given at the earliest possible moment, as is made clear once more by results just recorded by SHAW, THELANDER, and LIMPER.[8]

It is by studies of disease in small communities where all the factors can be examined at once and where the whole population, healthy as well as sick, is constantly under the eye of the observer, that our knowledge of the œcology of disease is most likely to be advanced. Mr. SCOTT BROWN is therefore to be congratulated on grasping his epidemiological opportunity. Such opportunities are uncommon, and they are usually allowed to pass by, never to recur.

STUFFINESS.

WITH the development of the domestic side of architecture a new sensation of stuffiness seems to have arisen. In the great hall and smaller rooms of an ancient castle, or the mud and wattle huts of the poorer classes in the Middle Ages, no lack of ventilation could have been apparent, as can be testified by those who have made gallant attempts to live in the stately homes of their ancestors, the principal winter consideration being how to avoid draughts. The extended use of glass windows, grates instead of big fires under large chimneys, the general use of well-fitting doors instead of hangings, and later the installation of gas and electric fires, have produced a different state of affairs, and in most modern houses and business offices the question of air conditioning has become important. This aspect of the problem of obtaining comfort has become more acute as reasons of convenience and economy have led to the use of central heating instead of individual fires.

Most of the authorities on hygiene during the last century, in view of the facts learnt about respiration and its products by the earlier biochemists, attributed the feeling of uneasiness, observed in heated rooms in which the concentration of humanity was high, to a pernicious or at least inconvenient excess of one of the principal products of respiration and of combustion—viz., carbon dioxide. The death of animals entering atmospheres such as that of the celebrated grotte du chien, at Royat in the Auvergne, in which this gas was known to accumulate in large quantities, must have given what seemed like irrefutable sanction to this theory—which was, however, not universally held. On the other hand, those who enjoyed their something-and-soda must have marvelled, if they thought about such things, at the slow rate at which they were poisoned. The high proportion of carbon dioxide invariably found in the air of stuffy rooms, and such places as theatres, public halls, and churches when well attended, nevertheless gave strong confirmation to the views of the orthodox school, which could claim the classical authority of LAVOISIER. Early in this century J. S. HALDANE informed a Select Committee of the House of Commons that carbon dioxide was itself of no importance, and was only to be considered as an index—not of course to be despised on this account. The proportion of carbon dioxide found in country air is about 0·03 per cent. by volume, and under indoor conditions it may reach 1 per cent. The consequent decrease of oxygen is rather greater but, as it is quite easy to breathe air which contains several per cent. less oxygen than the normal 21, or attenuated mountain air in which the actual pressure of oxygen is equivalent to less than half that in air at sea level, this is clearly not an essential factor. The theory of poisonous emanations leaving the body in the expired air has been found attractive, but there does not appear to be any evidence so far adduced to support a view which is certainly held by very few to-day.

Of recent years attention has been directed to the effect of the other principal product of respiration—namely, water vapour—on the air of occupied rooms, and much experimental work has been done by confining willing subjects in sealed chambers with devices for investigating the temperature and composition of the air and observing the physiological and psychological reactions of the subjects to the conditions. The main result of many researches has been to show that temperature and humidity are dominant factors in determining the well-being and working efficiency of persons who pass much of their time indoors in artificially heated rooms. The thermostatic arrangements of the human body, which are very efficient, depend chiefly on the regulation of the loss of heat by altering the rate of evaporation of water from the skin. It is now a commonplace of physics that, given a sufficient source of heat, such a process as evaporation depends for its efficiency on the speed with which the vapour can be diffused away from the evaporating surface. This is determined by the rate of movement of the air into which the vapour is evaporated and by its unsaturation. Clearly in still air removal of vapour must be very slow, owing to complete or nearly complete local saturation, when the

[7] THE LANCET, Nov. 21st, p. 1144.
[8] Jour. Amer. Med. Assoc., Nov. 28th, p. 1620.

return of molecules of vapour to the liquid almost if not quite compensates evaporation. If the air generally is not nearly saturated escape of water as vapour into it must be fairly rapid. Hence the feeling of malaise experienced in so-called close weather and in moist warm surroundings, and the relief in all states except absolute saturation—which even in rainy or foggy weather is seldom or never reached—obtained by fanning or the use of motor-driven circulating fans. Among the foremost who have experimented on these matters is Sir LEONARD HILL, whose kata-thermometer, used with discretion, has been found to give valuable indications of the condition of the air from a hygienic point of view. It is therefore of peculiar interest that he has recently, in a lecture delivered at the Royal Institute of Public Health (and published in its journal for December), described what he considers an important, and certainly hitherto unobserved, factor in the conditioning of air. HILL attributes stuffiness, to which he is himself very sensitive, not to a mystic quality of ionisation which is sometimes invoked, but to the absorption by the horny epidermis of the longer infra-red rays emitted in relatively large proportions by radiants such as dull red electric fires, which certainly emit neither carbon dioxide nor water vapour. He says:

> "While my nasal airway has become obstructed when I faced an electric fire even 47 feet away, the interposition of a screen in front of the face, or the turning of the back to the fire, immediately results in the nose opening. It is quite clear then that the effect on the nose is a nervous reflex, due, not to the heated air, but to rays coming from the fire and acting on the naked skin of the face."

And he is confident that the long infra-red rays are the hitherto unknown or *x* quality of the atmosphere of stuffy rooms. It appears from the lecture that the unpleasant symptoms are not observed if a sufficiency of shorter rays fall on the skin to stimulate the deeper nerve-endings, or when suitable screens are interposed. If further experiments described in more detail than can be given in a more or less popular lecture, and based less on what may prove to be the idiosyncrasy of a person or persons, should confirm these observations the discovery would have a far-reaching effect on the design of sources of heat and on current schemes of air conditioning and ventilation. There is a good deal at stake, and it must be freely admitted that the most pleasant means of domestic, office, and workshop heating are those in which glowing radiants are used.

CHEMICAL CONSTITUTION OF THE VITAMINS.

WE used to believe that in isolating the vitamins and identifying them chemically, the greatest difficulty was the smallness of the quantities in which they are present in the various foods from which they are derived. If a vitamin could be handled in a comparatively pure form, it seemed probable that exact knowledge of its nature and constitution would quickly be obtained. But vitamin D, or a form of it, has now pretty certainly been handled and subjected to physical tests, and yet we do not know chemically what it is. In June last, those who were present at the discussion at the Royal Society on the chemistry of the vitamins heard an account of three different attempts at isolation of the antirachitic substance. R. B. BOURDILLON [1] and A. WINDAUS,[2] with their respective co-workers, both described the isolation of an actual crystalline substance from the mixture of substances produced by the ultra-violet irradiation of ergosterol. BOURDILLON'S method was to use vacuum distillation while WINDAUS brought about a separation by use of maleic anhydride. The two products agreed in their biological activity and in some but not all of their physical properties. Since then WINDAUS [3] has associated an active material, which he calls vitamin D_2, with the name of O. LINSERT, retaining for his own material the name of vitamin D_1. BOURDILLON [1] had already made the suggestion that there is more than one active substance, and in a letter to *Nature* of Oct. 31st, signed by his team in his absence through illness, the position is summed up thus: "It follows either that there are several substances having antirachitic activity or that none of these preparations is pure, and that the varying optical rotation is due to the presence of one or more impurities." Pure vitamin D is not therefore yet certainly isolated. As regards the chemical constitution of the vitamin, BOURDILLON suggests that it is an isomeride of ergosterol [1] and WINDAUS [2] believes that in the photochemical transformation of ergosterol into vitamin D the molecular formula, the alcohol group, and the three double bonds are left unchanged, and that a structural rearrangement takes place which leads to an increase in the spatial size of the molecule.

Vitamin A also presents its own particularly complex chemical problem, for its relation to carotene is still by no means clear. When this year P. KARRER and co-workers and R. KUHN and E. LEDERER demonstrated that carotene consists of at least two forms, α and β carotene, with different melting points and different optical rotations, mixed in varying proportions, it appeared as if the whole position must be revised, and the specific parenthood of carotene towards vitamin A was again much in doubt. Further research,[4] however, has shown that the two forms of carotene have the same biological value as sources of vitamin A, which is strange since one form is optically active while the other is not. That vitamin A appears in the liver as the result of feeding purified carotene is generally accepted from the work of T. MOORE, but there cannot be any simple quantitative relation between the two, since concentrates of vitamin A have been prepared from liver oils, which are biologically active in doses much smaller than the minimal effective dose of carotene. O. ROSENHEIM and

[1] Proc. Roy. Soc. B., 1931, cviii., 340.
[2] Ibid., p. 568.
[3] Annal. d. Chem., 1931, clxxxix., 252.
[4] Ber. Chem. Ges., 1931, lxiv., 1859; Arkiv Kemi Mineral. o. Geol., 1931, x., No. 15.

W. W. STARLING have lately pointed out the ease with which carotene appears to form adsorption compounds when treated with iodine. If vitamin A were simply a substance adsorbed on carotene, one would expect that the absorption spectrum usually regarded as characteristic of it, with a band at 328 μμ in the ultra-violet, would be visible together with that of carotene; but it is not, although in naturally occurring mixtures of carotene and vitamin A, such as butter, the 328 μμ band is visible (R. A. MORTON and I. M. HEILBRON). This band, or one very near it, is possessed by a certain colourless substance derived from carotene (dihydrocarotene), but evidence of its biological activity is conflicting. B. AHMAD and J. C. DRUMMOND [5] found it gave irregular results but with little real evidence of biological activity, while EULER and his co-workers [6] found it definitely active, but not apparently in doses small enough for it to appear likely that it could be vitamin A itself. Lastly, from America comes a statement that liver tissue contains an enzyme capable of converting carotene into vitamin A in vitro, as evidenced by the disappearance of the carotene and the appearance of the absorption band characteristic of vitamin A (H. S. OLCOTT and D. C. MCCANN [7]).

A and D are the only two vitamins about whose chemistry we have any solid body of knowledge and it is obvious how incomplete their story still is. A report is to hand that vitamin C has been isolated by a Scandinavian worker, but until a scientific account of the work is available no comment can be offered. As regards vitamin B_1, the antineuritic vitamin, B. C. P. JANSEN and W. F. DONATH in 1927 prepared from rice polishings, by very elaborate fractionation, a crystalline substance which they believed to be the hydrochloride of the antineuritic vitamin, but it is noteworthy that the substance chosen as a standard for vitamin B_1, by the League of Nations committee on vitamin standardisation, was an adsorption product on fuller's earth of an extract of rice polishings. Of vitamin B_2 there is nothing to be said, save that it appears to possess a close and curious association with protein.

The problems still are legion, but the progress is none the less remarkable since the time, only some ten years ago, when vitamins A and D were not distinguished as separate entities.

[5] Jour. Soc. Chem. Ind., 1931, l., 183T.
[6] Helv. Chim. Acta, 1931, xiv., 838.
[7] Science, 1931, lxxiv., 414. Quoted in Jour. Amer. Med. Assoc., Nov. 28th, p. 1628.

ANNOTATIONS

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

THE seventh annual report of the London School of Hygiene could have no other opening than a mention of its great loss in the death of its Director, Sir Andrew Balfour. His passing has signalised a certain change in the management of the School, which is now a school of the University of London, but one which has imperial and international responsibilities of a more direct kind and in greater degree than are usually found in university schools. The board of management felt that the School should have regard to university tradition and university standards, and the post left vacant has not therefore been filled by the appointment of another director, but the duties have been entrusted to a member of the professorial staff acting as dean. Prof. W. W. Jameson was appointed dean for five years from May, 1931. His first report shows the immense amount of work carried out in the School. There are now six departments, some of them with subdivisions: public health; bacteriology and immunology; biochemistry, with chemistry as applied to hygiene; epidemiology and vital statistics; clinical tropical medicine; and medical zoology, with helminthology, protozoology, and entomology, while the Institute of Agricultural Parasitology at the St. Albans farm forms another department in close touch with the work of the School. Almost a separate division, though at present included under public health, is the department of medical industrial psychology and applied physiology, which is enabling the School to play a large part in the revolution that is taking place in psychological training. The students have given an excellent account of themselves in examinations, and a list of their countries and destinations emphasises once again the cosmopolitan field influenced by the School.

An agreement has been made with the Seamen's Hospital Society whereby members of the medical staff of the Hospital for Tropical Diseases form the staff of the new division of clinical tropical medicine at the School. This places the valuable clinical resources of the Society at the disposal of the students. Through the special programmes of instruction and study tours, the whole health organisation of Great Britain is laid open by the School for the information of students from overseas, and the dean's report shows throughout that the conception of the School as a great centre of teaching and research is being realised.

So great an international service naturally involves a large budget. When at least £10,000 per annum must depend on voluntary support, and particularly when great employers of labour are suffering from grave industrial depression, the position naturally cannot be free from anxiety. The School has no funds whatever to finance research work except the ad hoc grants for particular investigations provided by such bodies as the Medical Research Council, the Empire Marketing Board, and the Department of Scientific and Industrial Research. Additional funds are needed at the earliest possible moment if the great programme which the School has set itself is not to be curtailed.

HÆMORRHAGIC BRIGHT'S DISEASE.

IN the Thayer lectures [1] in clinical medicine, delivered before the Johns Hopkins Medical Society, Dr. Thomas Addis recapitulates the natural history of that form of Bright's disease which is more commonly known as glomerulo-nephritis, and has recently been named nephritis acris.[2] For a considerable number

[1] Bull. Johns Hopkins Hosp., 1931, xlix., 203, 271.
[2] Med. Research Council Spec. Rep. Series No. 142, 1929.

of years an admirable clinical research on this subject has been carried out by Addis and those associated with him in elucidation of the different phases of this disease. The present position, as outlined in these two lectures, harmonises with the results of van Slyke and his co-workers,[3] who similarly subdivide Bright's disease into three main types: hæmorrhagic, degenerative, and arterio-sclerotic nephritis. In cases of the hæmorrhagic type observed from the onset of the disease Addis finds that the subsequent history develops in one of three directions. Thus in a total of 51 cases rather more than half recovered completely and were lost sight of, while six went steadily downhill into uræmia. The remainder, and these principally excite comment, entered into a latent stage after the acute attack had subsided, in which the patients "felt perfectly well as far as they knew, or as far as the clinician could tell them by the methods of inspection, palpation, percussion, and auscultation." The clinician, however, by a quantitative estimation of the protein, red cells, and casts in the urine could say that the patient was in fact suffering from Bright's disease, and, from the notable excess of red cells present, could identify it as the hæmorrhagic form. Addis found that in 25 patients the average duration of this latent period was 12 years, and his current work on 77 patients confirms his conception that hæmorrhagic Bright's disease, when it passes beyond the acute stage, persists for decades rather than for years. The terminal phase is that of renal failure. Moreover, he points out how easily the onset of the disease may be unnoticed by the patient, especially if it affects an adult, and quotes the case of a man who went to his physician to find out why his weight had suddenly increased by more than 10 lb.; "he did not know that his urine had a dark mahogany colour, that he had a hypertension, and that he had a slight generalised œdema." The significance of these facts is obvious: they provide an explanation of the mechanism of that insidious form of chronic nephritis, or nephritis repens, the starting point of which has always been a puzzle to the clinician. As Addis points out, it is most readily understood if it is regarded as belonging to the category of hæmorrhagic nephritis, and there is good reason to anticipate that a continuation of his work will establish this point. The histology of Bright's disease is certainly in accordance with his view.

[3] Medicine, 1930, ix., 257.

SUICIDE STATISTICS.

Part I. (Medical) of the Registrar-General's Statistical Review of England and Wales for the year 1930 (7*s.* 6*d.*) contains a table of suicide statistics classified in accordance with information furnished by coroners. The classification is by sex, age, and method. There were 5056 suicides in the year, 3527 males and 1529 females. Why are men less tenacious than women in the struggle of life? The Registrar-General's review gives us the bare figures; it offers no explanations. The table shows the prevalence of suicide at different ages. There were 400 male suicides between the age of 25 and 35, 548 between that of 35 and 45, 861 between 45 and 55, 869 between 55 and 65, 482 between 65 and 75, and 147 of the age of 75 and upwards. The figures for women do not follow quite the same progression. There were 250 female suicides between 25 and 35 years of age, 276 between 35 and 45, 383 between 45 and 55, 289 between 55 and 65, 167 between 65 and 75, and 37 from the age of 75 onwards. The 1930 totals require, of course, to be coördinated with those of previous years and to be adjusted with statistics of the number of men and women of those decennial age-groups. As they stand, the figures indicate that both men and women pass through a bad time between the ages of 45 and 55; in the following ten-year period men seem to be less resilient than women. As to the method adopted, if we add the figures for both sexes together, we find 1348 cases of coal-gas poisoning, 887 of drowning, 753 of hanging or strangulation, 613 of death by the use of cutting or piercing instruments, 262 of death by firearms, and 214 of railway suicides. In proportion to the other sex, more men than women hang themselves, more women than men have recourse to gas poisoning. Only 8 women commit suicide with firearms, as against 254 men. Cases of suicide by taking solid or liquid poisons or corrosive substances amount to 715. Here the availability of the means is reflected by the detailed figures. Lysol—available, as recent litigation has shown, by purchase from automatic machines—accounts for 354 men and women, while opium, laudanum, and morphia account for only 5. The latter figure illustrates one valuable result of the restrictions imposed by the Dangerous Drugs Acts and Regulations. Other means of suicide in this category are carbolic acid (56 cases), hydrochloric acid (53), potassium cyanide (43), prussic acid, hydrocyanic acid (29), oxalic acid (26), ammonia (19), and strychnine (4). Although there are very few "weed-killer" cases of suicide, the figures in this category of poisonings may cause the public to consider how far it is desirable to permit the almost indiscriminate retailing of poisons by persons not specially trained in knowledge of the properties of the drugs they sell. It is a matter not to be ignored when any amendment of the Poisons and Pharmacy Act is proposed.

MEDICAL USES OF RADIUM.

THE ninth report on radium, issued by the Medical Research Council,[1] summarises the present position of radium therapy and gives a general indication of the results of treatment of cancer. As the technique improves and becomes more familiar, better results are obtained, but malignant disease of the œsophagus and rectum still presents an insoluble problem, although it is sometimes possible to convert an inoperable rectal growth into an operable one. All the centres have recently been asked to send returns showing the numbers treated by the various methods. Replies from Aberdeen, Cardiff, St. Mark's Hospital, St. Peter's Hospital, and University College Hospital show that just over 1000 cases were treated during 1930, of which 18·5 per cent. were too far advanced for any but palliative methods. Of the remainder, 44·3 per cent. were treated by radium alone, 39·5 per cent. by surgery alone, 3·5 per cent. by X rays alone, 6·7 per cent. by surgery and radium, 2·7 per cent. by surgery and X rays, 2·6 per cent. by radium and X rays, and 0·7 per cent. by surgery, radium, and X rays. For cancer of the breast radium has been fairly widely used with considerable success, sometimes alone and sometimes combined with surgery. The report is illustrated with a number of plates showing pathological specimens. The effect of irradiation on the primary growth seems, as a rule, to be satisfactory; those who die, die of distant metastases. For cancer of the cervix the technique of

[1] Medical Uses of Radium, Summary of Reports from Research Centres for 1930. H.M. Stationery Office. 1931. Pp. 37. 1*s.*

Stockholm is the more general, but that of Paris is sometimes applied. Cancer of the tongue has been treated by interstitial needling, and growths of the hard palate by prolonged exposure to small doses of radium in dental carriers. The results in inoperable cases have been encouraging. Birmingham regards the larynx as the most hopeful sphere for the use of radon, particularly for extensive septic inoperable growths from the pharynx and hypopharnyx. St. Peter's Hospital has treated 28 cases of cancer of the bladder and finds that the combination of diathermy with radium gives immediate relief to advanced incurable cases and will also control severe hæmorrhage. From the Royal Infirmary, Manchester, comes a report on five hemispheral gliomas treated by external radiation; two patients are in good health, one makes no progress, and two are dead. It is clear that gliomas as a class are not very radio-sensitive. The Middlesex Hospital reports two cases, both successful. Experimental work has been continued at St. Bartholomew's on the effects of radium on the cerebral tissue of the rabbit. It has been found that considerable damage is done by the end of 20 hours, although hæmorrhages do not appear before the twenty-fourth hour. Since there is always proliferation of neuroglia when radium needles are inserted, it seems unlikely that radium will be therapeutically useful in the treatment of those gliomas of which the cells resemble those of the adult neuroglia. Radium treatment has been attempted in certain cases of brain tumour in the surgical unit, with varying results. A correlation of the clinical results of radium therapy with the histological types in sarcomata shows that spindle-cell sarcoma gave 50 per cent. of good results in 24 cases; round-cell sarcoma gave 41 per cent. of good results in 22 cases and lymphosarcoma gave 23·5 per cent. of good results in 17 cases. Obviously radium has a sphere of usefulness in sarcoma.

BURNING CELLULOID.

SINCE the Cleveland disaster two years ago[1] much attention has been given to the dangers arising from the inflammable nature of the cellulose nitrate base upon which ordinary X ray film is laid. They were strikingly illustrated in a moving picture shown by Prof. Fedor Haenisch, of Hamburg, to the British Institute of Radiology at its annual congress held in London last week. Besides the nitrate base there is the so-called safety film, in which the base consists of cellulose acetate. This costs about 20 per cent. more than the other, it is more difficult to handle in the dark room, and there is some doubt whether the finished film has the same permanence as on the nitrate base. For these reasons nitrate film is still used by the great majority of hospitals and private radiologists. The principal danger to life from its use is not so much the risk of fire from the freely burning film, as the inhalation of toxic gases evolved when the celluloid undergoes flameless disintegration in the absence of a free supply of oxygen. Prof. Haenisch showed how when a blazing mass of nitrate film is thrust under the surface of a large excess of water the flames may be extinguished all right, but the celluloid continues to decompose beneath the water until the whole of it is destroyed, with evolution of large volumes of gas consisting of the various oxides of nitrogen, carbon monoxide, and prussic acid. The most dangerous of these appear to be the oxides of nitrogen. After the Cleveland disaster the American Chemical Warfare Service showed that the inhalation of these fumes in a concentration of three to five parts per 10,000 of air is immediately fatal. And a kilogramme of celluloid can liberate some 600 litres of gas when this flameless decomposition occurs. It is essential for firemen and all who have to deal with nitrate film to be aware of the danger from inhalation of minute quantities of nitric fumes.

In Germany a definite standard has been laid down to which film sold as "safety" must conform. A strip 20 by 3·5 cm. of the film to be tested is clamped in a horizontal position by one end, and a match is applied to the lower corner of the free end. If the film either ceases to burn upon the withdrawal of the match, or takes more than 60 seconds for its complete combustion, it is entitled to be described as safety film. Prof. Haenisch illustrated this test with both nitrate and acetate samples, and showed that the test strip of the latter invariably ceased to burn immediately after the withdrawal of the match. The acetate film will not smoulder, or undergo flameless disintegration, and therefore does not evolve toxic gases in any serious quantity. Hence the storage danger of acetate film is no greater than that of paper. He also demonstrated the slowing down of the combustion rate of nitrate film brought about by the paper and cardboard wrappings in which it is sent out. When an unopened packet of 12 nitrate films was placed in the actual flame of a bunsen burner, some five minutes elapsed before the film took fire; it was then easily extinguished, and it was found that only the extreme edges of the films were burned. It is most desirable that film makers should reduce the price and, if possible, remove the inherent drawbacks of the acetate base. In the meantime stringent regulations governing the storage of nitrate film have been made in America and Germany. They are in fact so drastic that the cost of their application would be prohibitive in most hospitals in this country, and it is doubtful whether they are necessary. What really matters is that the film store should be situated either in an outbuilding, or else on the top floor of the building, so as to minimise the risk of invasion of the inhabited portion by the fumes, should ignition occur. The store should be well ventilated, and have a thin glass window, easily broken by air pressure, to allow of the free escape of the gases. High-pressure steam heating and plug connexions for portable electric lamps are to be avoided, and precautions should be taken to prevent overheating by the sun, where that is possible. For it must be borne in mind that overheating of the film, without the application of an actual flame, may be enough to initiate disintegration. The American regulations insist upon automatic sprinklers, but the quantity of water available would hardly suffice to extinguish the burning celluloid, and might well chill it to the point at which flameless decomposition would take place. Once any considerable quantity of celluloid has become ignited, it is probably safer to allow it to burn freely until it is all destroyed.

[1] THE LANCET, 1929, i., 1099, 1107, 1178.

RESUSCITATION.

THE efficiency of carbon dioxide in restoring respiration and of puncture of the auricle in restoring the heart beat were emphatically illustrated in the paper which Sir Francis Shipway read before the Anæsthetic Section of the Royal Society of Medicine on Friday last. He dealt with resuscitation of patients collapsing during anæsthesia and of the newly born. For the latter, warmth, artificial respiration gently performed, and inflation with carbon dioxide and oxygen were the remedies recommended, a

distinction being drawn between the treatment of the "blue" and the "white" infants. With regard to massage of the heart and to intracardiac injections as methods of restarting the heart beat Sir Francis showed that subdiaphragmatic massage was rarely successful, and that so many different drugs had been successfully injected intracardially that probably success was not dependent on the drug at all. In support of this argument he cited the laboratory work of Watson who, in 22 out of 60 experiments on dogs killed by chloroform, restarted the heart beat by puncture of the heart alone. A. S. Hyman's clinical work was quoted in further support of the contention that it is the needle puncture of the heart, not the injected drug, which is the essential factor in restarting the heart by intracardiac injection. Moreover, it was shown that puncture of the auricle is better than puncture of the ventricle, for the auricle is more sensitive to stimulation and also if fibrillation is set up then it is not incompatible with life. Efforts to restart the heart should be made not more than five minutes after the beat has ceased, but the determination of this movement was shown to be extremely difficult. In the case reported by Dr. A. Fakhry in our correspondence columns this week, the pulse was still occasionally perceptible, though the patient's condition seemed desperate. The danger of delay lies in the inevitable damage to cortical cells of the brain if they are deprived too long of their oxygen supply. Illustration of this fact was given in the case of the child collapsing after a tonsillectomy, who was revived after the heart had apparently ceased to beat at least 13 minutes. Her eventual recovery was accompanied by cerebral symptoms that lasted for two years. Sir Francis alluded to the danger of adrenalin in the presence of chloroform anæsthesia and did not believe that it was limited, as A. G. Levy has maintained, to light narcosis. He insisted on the necessity for promptitude in the application of restorative measures when these are needed, and at the close of the meeting demonstrated several forms of restorative apparatus. Dame Louise McIlroy described her methods for dealing with newly born infants that required resuscitation. She uses oil, not baths, and warmth, gentle squeezing of the chest, and application of oxygen with 5 per cent. carbon dioxide. The many other speakers who followed evinced a certain amount of difference of opinion as to the desirability or not of employing endotracheal intubation early in the process of resuscitation.

INDUCTION OF LABOUR BY MEDICINAL MEANS.

Two years ago [1] we drew attention to the fœtal deaths which occasionally follow medicinal induction of labour and are ascribed to the quinine generally employed. In this regard a paper by A. Mathieu and M. S. Sichel [2] is of interest because they review 320 cases seen in private practice during nine years and say that quinine was omitted from the last 120 without apparently detracting from the effectiveness of the method. By widely extending the indications for non-operative induction they claim to have saved much maternal mortality and several fœtal lives. Their results certainly support the claim, for in their 320 cases there were no maternal deaths, and the number of fœtal deaths, seven in all, was well below the usual 3 per cent. average rate. But the classification used and the lack of detail in their paper makes it impossible to judge accurately of the type of case selected for treatment in this way. Such indefinite reasons as distress and discomfort (48 cases), false pains (16 cases), and fear of precipitate labour (9 cases) are given and seem to suggest that expediency and the convenience of patient and doctor may be influential factors in determining the adoption of a method that is not regarded as carrying any risk to mother or child. The procedure adopted at first was to administer ℥ii. of castor oil and grs. x. of quinine sulphate followed two hours later by a hot soap enema. When the enema was about to be expelled, a hypodermic injection of ℥iii. of pituitary extract was given, and this dose was repeated half hourly till labour began or 15 injections had been given, after which no more pituitary was injected. Failure was admitted and the induction was stopped if labour pains did not begin within eight hours of the first injection. The dose of quinine was later cut down to grs. v. and afterwards given up altogether. It appears that 96 per cent. of the cases were successful—about 70 per cent. at the first attempt, 20 per cent. at the second, and the remainder after 3, 4, or 5 attempts. The writers confirm the general experience that the nearer the patient is to term, the greater the proportion of immediate and successful inductions. With the cervix effaced, the head deeply engaged, and the os admitting a finger, response was readily obtained. When the head was floating and the cervix not taken up, it was often noticed that by the second or third attempt the head had become engaged and the response to the next attempt was usually rapid. In the 29 cases of spontaneous rupture of the membranes, which Mathieu and Sichel regard as an indication for their method, induction was always successful at the first trial. Apart from the excellent results recorded in this paper, the striking feature is the small percentage of cases in which natural delivery was attained. Doubtless there was among them an undue proportion of abnormal cases, but even making ample allowance on this account, the proportion of spontaneous deliveries was but 15 per cent., and in the birth of 323 children 80 per cent. were delivered by the forceps, version was performed 12 times, and pubiotomy and Cæsarean section each once. It is an open question whether women who have undergone this method of induction are in a condition which favours the best uterine action. Possibly the physical and psychical disturbance occasioned by the medical treatment may interfere with normal function, and the large proportion of failures to complete labour, necessitating the use of low forceps, suggests that this may be the explanation. If so, a practice suitable for a well-equipped hospital and skilled attendants may have its risks if adopted by all and sundry and in any circumstances; for in the long run injuries, morbidity, and mortality vary directly with the degree of interference in labour.

[1] THE LANCET, 1929, i., 1047.
[2] Surg., Gyn., and Obst., Nov., 1931, p. 676.

BACTERIOPHAGE IN CHOLERA.

Of late years we have frequently drawn attention to the work on bacteriophage which is going on in India. This work became more complex when I. Asheshov isolated three types of bacteriophage, and laid it down that for therapeutic purposes all these at least must be present.[1] Since then a good deal of intricate research has been undertaken, and it is steadily yielding fresh information. The individual types of bacteriophage, when separated, prove somewhat unstaple, and in artificial mixtures also they are liable to die. Natural mixtures from patients,

[1] See THE LANCET, 1930, ii., 1248.

on the other hand, remain good for at least two years, and Lieut.-Colonel John Morison, I.M.S., suggests that this fact may have physico-chemical significance and throw light on the nature of the bacteriophage itself. Colonel Morison, during a visit to this country, has described the ingenious methods now used for routine quantitative analysis, which make it possible to check the therapeutic preparations, detect deterioration, and study the strains derived from patients. The increasing precision of the work he reports is encouraging, and increases one's desire for proof that bacteriophage really can be used with effect against disease. Addressing the Section of Epidemiology of the Royal Society of Medicine on Nov. 27th, Colonel Morison was able to give some further account of field tests in India, but could not, to his own regret, produce the conclusive evidence so long awaited. At the same time his data are extremely interesting. For prophylactic and therapeutic purposes he prepares multi-type mixed cholera and dysentery bacteriophages obtained from many different sources. The final preparation is put up in ampoules of 2 c.cm., and this dose is taken in water as often as the patient can drink. The treatment is thus comparatively simple, and in several village epidemics the large majority of the population have been induced to accept it. Colonel Morison gave as one of his examples an outbreak already described in our columns,[2] in which the results were apparently very striking, but remarked on the extreme difficulty of judging the treatment of a disease like cholera, whose mortality always drops at the end of an epidemic. Like everyone else he wants to know what would be the effect of giving it to the first, the early, cases. And this is a difficult question to answer, because in Indian villages first cases are not reported by the headmen, and cholera is seldom diagnosed before several people have died. However, the remedy seems to be harmless, even in large doses, and there seems to be no objection to placing it in the hands of village headmen for administration at once to all cases of dysentery, diarrhœa, and suspected cholera. Two areas, each of nearly 600,000 population, were selected for trial on these lines, but in one of them (Habigunj) the district officers were unwilling to undertake the experiment, preferring the approved methods of disinfection of water-supplies, inoculation, and treatment with essential oils. Habigunj thus became a control, while in Naogoon, 140 miles away across high mountains, bacteriophage was issued to every village headman in December of 1929. During the first six months of 1930 63 scattered cases of suspected cholera were treated by the headmen, but there was no general outbreak then or since. The district has now been free from cholera for a period twice as long as any during the last ten years, but whether this is mere accident it is impossible to say until after the end of 1932—"Russell's periodic year of cholera"—when by all the rules it should certainly return unless there is some reason to the contrary. Meanwhile Habigunj, the control area, had both the spring and autumn visitation in 1930, and last spring, when a third epidemic began, the Government intervened and ordered the use of bacteriophage there as in Naogoon. Thus this district will no longer serve as a control, but its history will prove none the less interesting. "On the final outcome of this experiment," said Colonel Morison, "it may be possible to say whether, in areas not amenable to sanitation, to control of the water-supplies, or to preventive vaccination, we may depend on an attack on the disease through an agent active against the vibrio itself, which the first cases of an epidemic can be made to distribute as they ordinarily distribute the cholera vibrio."

[2] See THE LANCET, 1931, i., 358.

THE LONDON (R.F.H.) SCHOOL OF MEDICINE DINNER.

IN a season when many annual reunions are abandoned, and others are held in a form so modified as to spread gloom rather than cheer, the dinner of the London (R.F.H.) School of Medicine for Women, on Dec. 3rd, stood out as a joyous function. Well over 400 past and present students and their guests laid care aside for the evening and assembled at the Savoy Hotel; they were rewarded by an excellent dinner, bright speeches, and, later, opportunity for dancing. The speeches were happy in tone and in matter, being characterised by a charming irrelevance which was evidently deliberate. Only two speakers struck for a moment a serious note. Lady Simson commended to the memory of the efficient young students of to-day the courage, enthusiasm, and hardiness of the women who had made it possible for them to enter the profession. Dame Louise McIlroy described the anxiety of all connected with the Royal Free Hospital, from honorary staff to charwomen, during the recent illness of Lord Riddell, their president, and the joy which had followed his return, with renewed vigour, to active work in the hospital. Lord Riddell, the chairman, spoke with enthusiasm of some of the special friends of the hospital, and of its more famous daughters; he mentioned that during the year four past students had gained the F.R.C.S. and one the M.S., and that the overdraft of the hospital was £40,000. Dr. Haldin Davis enumerated, with appropriate comments, the guests whose health he was charged to propose, and Miss Delafield, Dr. H. H. Bashford, and Miss Peggy Salaman responded with grace, humour, and brevity. The chairman was toasted with musical honours, and the party repaired in good humour to the ballroom.

SIR PHILIP MAGNUS.

IN a recent note on Medical Men in Parliament (Nov. 28th, p. 1202) allusion was made to the generous help rendered to the Parliamentary Medical Committee by Sir Philip Magnus in the long period (1906–22) during which he represented London University in the House of Commons. Sir Philip, now in his ninetieth year, is, we are glad to learn, in good health.

Dr. Bernard Day has been appointed by the Secretary of State for the Colonies to be one of the consulting physicians in London to the Colonial Office.

BRITISH DENTAL HOSPITAL.—Sir Norman Bennett has consented to become president of this hospital, in succession to the late Sir Harry Baldwin.

ITALIAN STOMATOLOGICAL SOCIETY.—A new Italian society (Società Italiana di Chirurgia della Bocca e Orthopedia Dento-facciale) was founded at Parma on Nov. 15th. Prof. Alessandro Arlotta, of Milan, was elected president, and Prof. Giovanni Corradi, of Parma, secretary-general, and the first annual meeting of the Society will be held at Parma next May. Prof. Corradi's address is the Istituto di Odontoiatria, R. Università di Parma. He is director of this Institute.

SPECIAL ARTICLES

GENERAL MEDICAL COUNCIL.

(Continued from p. 1261.)

LAST week we reported the penal cases which came before the Council for its consideration with the exception of the final case which presented special difficulty, and the hearing of which occupied seven hours.

The following report is an abstract of the proceedings.

A Case of Alleged Canvassing.

The Case of Thomas Francis Roche, registered as of 1, Fairfield West, Kingston-on-Thames, L.R.C.S. Edin., L.F.P.S. Glasg., who had been summoned to appear before the Council on the following charge:—

"That, being a registered medical practitioner, you have personally, and or by means of an agent, canvassed with a view to obtaining patients, and in particular: (1) Some days prior to July 12th, 1930, by means of an agent, canvassed Mrs. Cherry, the wife of Garland James Cherry, who was a patient of Dr. Pattison Armstrong. (2) In the month of October, 1930, by means of an agent, canvassed the said Garland James Cherry, who was a patient of the said Dr. Pattison Armstrong. (3) In the spring of 1930, by means of an agent, canvassed Mrs. Doris Mary Austin, who and whose family were patients of Dr. Gerald Cock. (4) In the month of March, 1930, canvassed Mrs. Violet Lang to get her husband to join your panel. (5) In or about the month of June, 1930, canvassed Mrs. Lucy Goldring to join your medical club for her children and to get her husband to change to your panel. (6) In the months of February and March, 1930, canvassed Mrs. Kitty Robinson to get her husband, a patient of Dr. Goffe, to change to your panel. (7) In the autumn of 1930 canvassed Mrs. Elizabeth Lester to get her husband and stepson to change to your panel. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainants were Mr. Gerald Cock, M.R.C.S. Eng., L.R.C.P. Lond., 1914, and six other medical practitioners, all of Kingston-on-Thames.

Mr. Roche was accompanied by Mr. T. F. Davis, instructed by Mr. Garland-Wells.

Mr. C. Nyholm-Shawcross, instructed by Mr. Washington Fox, solicitor for the complainants, appeared after the proceedings had started to take the place of a colleague unexpectedly detained.

When the case was called Dr. E. G. Goffe asked to be allowed to open, but Mr. Davis objected on the ground that Dr. Goffe was not named as a complainant. Accordingly, Dr. Gerald Cock was permitted to open. Dr. Cock said that all the complainants had been troubled from the very beginning of the time when Dr. Roche had arrived in Kingston, about October, 1929. They had made complaints, and had met objections in one direction and another, and their complaints had not been heard until that day. Every way they had tried there had been obstruction, and there had been more obstruction that day than there had been before. He himself had taken it into his own hands to go to the Ministry of Health, but he had been told that nothing could be done.

Mr. Davis, while disclaiming any desire to be obstructive, asked the Council to request the complainant to observe some limit in the comments that he made. The President suggested that Dr. Cock should call his witnesses. Dr. Cock said that he did not want the case to start just like that; the complainants wished the Council to understand that the complaint had originated from the coming of Dr. Roche to Kingston, and had existed ever since, but for various reasons had not been brought to court long ago, as it ought to have been.

THE FIRST WITNESS FOR THE COMPLAINANTS.

Mr. Cherry, examined by complainants' solicitor, said that he was a painter and decorator, and lived at Norbiton. He had been on Dr. Pattison Armstrong's panel for many years. He testified to his statutory declaration, which stated that on some day before July 12th, 1930, a person had called on his wife and said that he represented Dr. Roche, and had requested her to get her three children on to Dr. Roche's club at 2*d.* a week each. The children had eventually joined. In October, 1930, a person had called on him and said that he represented Dr. Roche, and was collecting 6*d.* due in respect of the children. This man had asked, as the children were on Dr. Roche's panel, why the witness did not change his panel. The witness had given the man his medical card and agreed to change. The next thing he had heard had been that he received a new medical card with Dr. Roche's name on it. He had never been to Dr. Roche, and did not intend going to him; nor did his wife and family now intend going to him. They all intended to go back to Dr. Armstrong as soon as possible.

Cross-examined by Mr. Davis.

Q. Have you ever met Dr. Roche?—A. I cannot remember meeting him; I may have done. Q. You were not present when your wife decided to join the medical club for the children?—A. No. Q. So that of your own knowledge you cannot say what was said to your wife?—A. No. Q. Are you quite sure that it was in October that a person called upon you?—A. Yes, I think so. Q. Did you have a pink slip sent to you from the Insurance Committee?—A. No, no slip whatever. Q. In fact, were you not accepted as a panel patient of Dr. Roche's in July, 1930?—A. A medical card came through the post with Dr. Roche's signature on it.

The Legal Assessor: In July?—A. About July.

Mr. Davis: Was not the transfer complete in August?—A. I never heard anything from the Insurance Committee. Q. Are you asking the Council to believe that you never had any notice from the Insurance Committee?—A. I had no paper from the Insurance Committee. I got my medical card through the post. Q. If it is right that you were on Dr. Roche's panel in July and August, there was not much point in asking you to join the panel in October, was there? A. Well, I mean that I should not have joined at all, only the young man called upon me. Q. Did you tell him that you were already on Dr. Roche's panel?—A. I did not say that at all. Q. But you were?—A. Only from about October. Q. From July?—A. From July, rather. Q. Then you did not say "I am already on Dr. Roche's panel"?—A. Who to? Q. When he asked you—as you say—"to make it a family affair"?—A. No, I was on Dr. Pattison Armstrong's panel.

The Legal Assessor: Do you think you were wrong about the date, Mr. Cherry? You see, you have said here that it was in October, 1930?—A. That is right, it was in October. Q. But you said in answer to Mr. Davis that you got your card through by post in July; therefore, if that is so, you could not very well in October, unless you changed again, be on

Dr. Armstrong's panel.—A. I still had the medical card from Dr. Roche.

Mr. Davis: You said that you had got a card from Dr. Roche?—A. Yes, I had the medical card with Dr. Roche's name on it. Q. You are quite sure of that?—A. Yes. Q. Then why did you swear that you gave him your medical card, having agreed to change over?—A. I gave the attendant my card. He asked me for it; I said that I would not go to Dr. Armstrong to ask for a transfer.

Later, the Legal Assessor said: Are you not a little bit confused in your dates? You see, you could not have been put on Dr. Roche's panel and had your card to that effect in July, and then subsequently agreed to transfer to Dr. Roche in October, if you were already on his panel, could you?—A. I am confusing the dates. It was only just the latter end of 1930 when I was taken over by Dr. Roche.

Mr. Davis: I think you told us that you told the collector that you already were on Dr. Roche's panel?—A. I did not tell the collector I was on Dr. Roche's panel. Q. Do you want to go back on what you said just now?—A. No; I am not very well educated; I just told you that they came for the collection of 6*d.* a week for my three children, and I happened to go to the door, and the young man said to me: "Well, Mr. Cherry, as you have the children on, why not make it a family concern?"—Q. Had you changed back to Dr. Pattison Armstrong?—A. No.

Dr. Cock (interrupting): He is going to.

The witness: I am going to.

Mr. Davis: I thought you said in May that you were going to change back to Dr. Pattison Armstrong as soon as possible?—A. Yes. Q. You have not done so?—A. I have not done so yet. Q. I put it to you that your memory is not very clear as to what took place in 1930?—A. Well, it is clear to the best of my knowledge. Q. Was it not in May that you were first asked about this?—A. I know it was in the summer, because the young man used to call in the light evenings.

Re-examined by Mr. Shawcross.

Q. Are you quite certain now that your statement in your affidavit is true? Your recollection now at this moment is that someone called in October, 1930, and asked you to change your panel doctor to Dr. Roche?—A. That is right. Q. You are quite certain of that?—A. Yes.

Dr. J. W. Bone: I should like to be clear about this point. I think that the witness said his card was received through the post in July, and the transfer was complete in August. We have just heard that he was requested to transfer in October, and did so. Now, these things are diametrically opposed. I should like to know which is the witness's considered statement?

Dr. H. B. Brackenbury: I have not heard it put to the witness whether in fact he took any steps to transfer his panel . . .

The Legal Assessor: Mr. Cherry, did you do anything else except hand over your medical card in order to effectuate a change from Dr. Armstrong to Dr. Roche?—A. The young man just asked me, when he said about changing over and making it a family affair; I said, "I am not going to Dr. Armstrong to ask him to transfer me over." With that he said, "No, we see to all that."

The Legal Assessor: I will try to get at it in this way. Do you remember the time when somebody called on your wife; you were not there, but you remember the incident?—A. Yes. Q. When that person called on your wife in July, had you the card then from Dr. Roche or Dr. Armstrong?—A. I was still on Dr. Armstrong's panel. Q. Did anybody call on you with regard to your panel prior to that date, prior to October, or not?—A. Yes, in October. Q. Therefore, it is not correct to say that you had a card of Dr. Roche in July?—A. No. Q. You are quite clear that, up to October, you were on Dr. Armstrong's panel?—A. That is right. Q. And that in October you handed over your card to somebody who purported to call on behalf of Dr. Roche?—A. Yes. Q. Then you received a card subsequent to that, showing that you were on Dr. Roche's panel?—A. Yes. Q. That is all you did, you have done nothing else?—A. I have done nothing else.

Dr. Brackenbury: I am not clear on this point. There were two things that had to be done in order to secure another doctor. He had to give a fortnight's notice to the Insurance Committee that he desired to change, and then he could change to a particular doctor by handing that medical card to that doctor. I have not yet heard any question about any notice given to the Insurance Committee . . . . The collector could hand over his card and get the doctor's name, but that would not constitute giving a fortnight's notice to the Committee.

The Legal Assessor (to witness): Did you ever give a fortnight's notice to anybody?—A. No.

Mr. Davis then handed in the record card, which showed that the transfer to Dr. Roche was completed before August 27th.

Dr. Brackenbury pointed out that it was perfectly clear that the record card had been received on August 27th by Dr. Roche, and must have been taken from Dr. Armstrong some time before that.

Dr. Bone remarked that it was certain proof that on August 27th the witness had been on Dr. Roche's panel.

THE SECOND WITNESS FOR THE COMPLAINANTS.

Mrs. Cherry, called and examined by Mr. Shawcross, said that, about the beginning of July, somebody had called on her and asked her if she could get any patients to go on to Dr. Roche's panel.

Q. Was that the first thing he said, or did he say who he was?—A. Yes, he said he was Dr. Roche's canvasser; besides being the coal canvasser. He is canvassing for Booth's, the coal people, too. I thought he was Booth's coal man when he came to the door, but instead of that he was Dr. Roche's canvasser. Q. Did he say anything else?—A. Yes, he asked me would I get my husband to leave Dr. Armstrong and sign over on to Dr. Roche's panel. Q. How soon after that interview did you ask your husband about it?—A. The same night.

The Legal Assessor: When this man called, your children were already in Dr. Roche's club?—A. Yes, and then my husband fell out of work, and the man would not call any more, because we had no money to pay him.

The President: Did Dr. Roche actually attend any of the children?—A. Yes. Q. He was your doctor?—A. Yes.

Cross-examined by Mr. Davis.

Q. Did you tell your husband all about this?—A. I did. Q. When were you first asked to recollect what took place in July, 1930?—A. About three weeks ago. Oh, no, I beg pardon, it was in April. Q. Why did you say three weeks ago if it was in April?—A. Well, when we first spoke about Dr. Armstrong and the panel, that was in April, but we were only asked about the case three weeks ago. Q. Who asked you about it?—A. Dr. Cock came along. Q. He tried to get you to remember what

took place in July of last year?—A. Well, he did not try. Dr. Cock did not induce us to tell him anything. Q. Did he remind you of what might have happened?—A. Yes. Q. Did you ever tell your husband that somebody had called from Dr. Roche to get your three children upon his panel?—A. No, I did not. Q. He is quite mistaken?—A. Yes. Q. Have you discussed this matter with your husband since May last?—A. No, I have not. Q. Not a word?—A. No, I have other things to trouble about.

The Legal Assessor: Is your memory quite clear as to what took place in July, 1930, when this man called?—A. Yes.

Dr. Bone: When did your children first join Dr. Roche's club?—A. About July, 1930; I cannot recollect.

The Legal Assessor: You told me when I asked you that, when the man called, your children were then members of Dr. Roche's club.—A. Yes, they were. Q. When the man called?—A. Yes. They were on the panel about two months before the man asked me to get my husband to join. Q. I asked you whether they were members of Dr. Roche's club at the time the man called upon you?—A. Oh, no. Q. They were not? Just think, because I asked you some time ago, and I understood you to say definitely that they were members of Dr. Roche's club at the time the man called.—A. The man was recommended to me to come and ask me about getting all the children on his 2*d*. a week dispensary. Q. When the man called, your children were not members of Dr. Roche's club?—A. No.

Further cross-examined by Mr. Davis.

Q. Do you know a Mr. Hewson?—A. Yes. Q. Does he cut your children's hair?—A. Yes. Q. Did Mr. Hewson tell you that he had been a patient of Dr. Roche's?—A. No, he did not tell me that he was a patient, but he told me that Dr. Roche was starting a 2*d*. a week dispensary, and he wanted to know would I get the children to join up. Q. Did he suggest that it might be a good thing for you to have your children on the club?—A. Yes, he did. Q. Mr. Hewson was just there cutting your children's hair, and you discussed various medical people?—A. Yes. Q. And he recommended Dr. Roche to you?—A. Well, he talked about having the children on the panel, and said that he knew Dr. Roche was getting up the dispensary, and that he would send a man round to see me about getting the children on. Q. Did he say that he would mention the matter and get somebody to call?—A. Yes, he did. Q. In that way your children became members of the club?—A. Yes.

Re-examined by Mr. Shawcross.

Q. When did this interview with Mr. Hewson take place?—A. I cannot remember; about July, 1930. Q. Was it before or after the canvasser called on you?—A. It was after.

Sir Robert Bolam: May I ask whether the gentleman who called about putting Mrs. Cherry's children on the club called more than once?—A. He only called once, and I joined. Q. To whom did Mrs. Cherry pay the amount per week?—A. To the collector.

The President: Was that the same person?—A. It was the same man that called. Q. Then he called more than once?—A. He called every week for the money.

The Legal Assessor: You remember Dr. Cock calling on you three weeks ago?—A. Yes. Q. What did he start by saying to you when he called upon you?—A. Well, he knocked at the door and said he was Dr. Cock in Dr. Roche's case. Q. Was that the first you had heard about any case about Dr. Roche?—A. Yes. Q. You had never heard of it before?—A. No. Q. How did the conversation proceed?—A. Dr. Cock said that Dr. Roche's case was coming off, and he wanted to know whether we would be his witnesses. Q. That was the first you had heard of any case about Dr. Roche?—A. Yes. Q. What did you understand when he said he wanted you to be a witness in the case? You would want to know what you would be a witness about, would you not?—A. Well, I knew the case was coming off, of course, when we were talking to Dr. Armstrong. Q. I see: you had had a conversation with Dr. Armstrong. Did you know that your husband had been interviewed and had made a declaration?—A. Yes, I knew that. Q. Therefore you had talked with your husband about the case and you knew something about it?—A. I did not talk to my husband about the case. Q. You never spoke to your husband?—A. No. Q. What did Dr. Cock say to you about the case?—A. Well, Dr. Cock asked us to come up as witnesses about Dr. Roche's case. Q. Did you tell him what you were going to say?—A. No, I did not tell him what we were going to say. Q. Have you told anybody what you were going to say?—A. No. Q. Have you seen any solicitor?—A. No. Q. Or solicitor's clerk?—A. I have not seen any. Q. From the time that Dr. Cock asked you to come as a witness until you came into this room, have you told anybody at all what you were going to say when you came here?—A. No, I have not told anybody.

THE THIRD WITNESS FOR THE COMPLAINANTS.

Mrs. Lester, called: examined by Mr. Shawcross, testified to her statutory declaration in which she said that in the autumn of 1930 her daughter had become ill and she had tried to get her own doctor, Dr. Weston, to attend her, but as he had been ill he had not been able to do so. On the advice of a friend she had asked Dr. Roche to attend, and he had visited twice. On both occasions, and on two other occasions, when she had called for medicine, he had asked her to get her husband and stepson to become his panel patients, but they had refused to change their doctor. Further, Dr. Roche had on four or five occasions this year asked her whether she had yet succeeded in getting her husband and son to agree to join his panel, but she had never given him a decided answer.

Cross-examined by Mr. Davis, she said that she used to dodge Dr. Roche, so that he should not ask her, because she got sick of his asking her to get her people to join his panel. Q. Did Dr. Roche just say, "Get your husband to change his panel?"—A. Yes, he did, and he pressed me; he said, "Don't forget." I thought to myself, "No, I won't," and went straight in and asked my husband, and he turned round and said "No, I am not going to change; I have had my doctor (Dr. Weston) all these years and we are not going to change now." My husband got cross with me to think that I should ask him to change his doctor. Q. Was Mrs. Roche present on any of the occasions when you have spoken to Dr. Roche?—A. In June, in Surbiton-road—Kingston, like—Dr. Roche came along, and he nodded, and I nodded, and he said to me, "Have you made up your mind?" and I walked away and never said anything. They were both there. Q. On that occasion did not Dr. Roche just get into the car?—A. No, he did not, because he stood there talking and asked me if I had made up my mind. Q. If that is so, then Mrs.

Roche must have heard it?—A. Yes, quite right. Q. How many times did you say Dr. Roche has spoken to you this year?—A. About four times. Q. Where?—A. In Surbiton, it was; once in his surgery and twice in his car in different roads . . . Q. How many times have you spoken to Dr. Roche this year?—A. Twice. Q. Are you sure it is twice?—A. Yes; up at Surbiton, up the hill, and also down town. Q. On every other occasion you have avoided him, have you?—A. Yes, I have dodged him. Q. Why did you swear you had spoken to him four or five times this year?—A. I used to dodge him. Q. He has not spoken to you and you have not spoken to him more than twice this year?—A. Yes. Q. Then why did you swear that you had spoken to him four or five times this year?—A. I mean out in the street, not in his surgery or anything like that. I am talking about out in the street. Q. Did Dr. Cock call on you, too?—A. Yes. Q. Did he tell you what the charge was that was being brought against Dr. Roche?—A. No. Q. Did you not know what you were being approached about?—A. Yes, I did. Q. What did he tell you was the charge against Dr. Roche?—A. Asking me to join the panel. Q. Did Dr. Cock suggest to you that Dr. Roche had asked you to get somebody to join the panel?—A. He asked me, and that is all I know.

Re-examined by Mr. Shawcross.

Q. When you swore this declaration and said that on four or five occasions this year Dr. Roche asked you whether you had succeeded in getting your husband and son to agree to join his panel——A. Yes, that will be right, because there was once down town, once up at Surbiton, and once along where the old church is; that is four times. Q. That makes three times.—A. And once against St. John's Church, where he had the motor; that makes four times.

THE FOURTH WITNESS FOR THE COMPLAINANTS.

Mrs. Lucy Goldring testified to her statutory declaration, saying that she had called at Dr. Roche's surgery about June and that Dr. Roche had asked her who her medical man was and suggested that she should join his medical club for the children and given her all particulars, saying that it was a condition that her husband should go on to his panel. He had said, "Talk it over with your husband, and I will send my collector on Saturday." Dr. Roche had criticised Dr. Davidson's treatment of her children and said that Dr. Davidson's medicine was only Epsom salts diluted. She had asked if she could join for the children alone, and the collector had said "No"; that he had tried to persuade the doctor to have a club for children alone, but that the doctor had insisted on the parents going on to his panel also.

Cross-examined by Mr. Davis, she said that Mrs. Roche had not been present, and that she herself had not taken any particular notice of the conversation at the time. Q. How many months afterwards did you first try to remember what took place?—A. A long time after. I did not try to remember at all. Q. Have you really not tried until to-day?—A. It was a matter of conversation that we were having. Q. Do you not know lots of parents whose children are on the club but who themselves are not on Dr. Roche's panel?—A. That is only recently, not at the time.

The first to tell her that the case was being brought against Dr. Roche had been Dr. Milburn. She did not know anything about his dealings with Dr. Roche's other patients; that was the first time she had seen Dr. Milburn. He had introduced himself through a patient of his. She had told Dr. Roche that she had been receiving treatment from Dr. Davidson.

Q. Did you say that he was a homœopathic doctor? A. Why; what does that mean? Q. Was anything said about what a homœopathic doctor does?—A. No, he said that Dr. Davidson's medicine was only Epsom salts diluted down.

THE FIFTH WITNESS FOR THE COMPLAINANTS.

Mrs. Kitty Robinson testified to her statutory declaration, in which she said that her doctor was Dr. Goffe; that her little girl, aged 8, had been ill for three days in February or March, 1930, and that she had sent for Dr. Roche because he had been nearest. He had said, "As I am going to be your medical adviser, what about your husband?" She had said that he was on Dr. Goffe's panel, and Dr. Roche, had said, "Still, if I am going to attend you——" and had then broken off. She had spoken to her husband, who had not wanted to change. Later, she had gone round to Dr. Roche's surgery with her sister, who had been pregnant, and he had then said, "Your husband has not been to see me." Her husband had subsequently changed his panel and had then changed back again to Dr. Goffe.

Cross-examined, she could not remember the exact date in February or March; it had been just a casual conversation. Nevertheless, she was quite sure what had been said. She could not account for the discrepancy between her present evidence and that of her statutory declaration in December.

Dr. L. P. Gamgee inquired whether the witness now alleged, as in her statutory declaration, that Dr. Roche had said "It would be no trouble for him (her husband) to change."—A. No, he did not say that. He said, "Your husband has not been to see me yet," and I said that I would speak to him again.

THE RESPONDENT'S CASE.

Dr. Roche, examined by Mr. Davis, said that he had practised in Kingston from 1911 to 1913, and had returned in November, 1929, to the part of the town in which he had practised before, where he had been quite well known. He was the only resident doctor in the locality where he had settled, and the nearest doctor to a very big centre of population at Springgrove, Norbiton. He had equipped his surgery particularly well and had never given precedence to private patients over panel patients. He had never canvassed or given anybody authority to canvass, nor had anybody ever canvassed for him to his knowledge. He had started a medical club in March; he had had a club in Kingston years before. The charges fixed in March had been 3*d.* a week for the first member of a family, 2*d.* a week each for two or three children, and if there were four children 7½*d.* A club of this character was required to meet the needs of the people. If a person came to his surgery and applied for membership, he told them that he would send the collector. In 1930 he had employed a man named Ross, who had been his collector in 1913 and who had continued to collect for the club for his successor. Ross had been cautioned in every shape or form that in no circumstances was he to be drawn into any suspicion of canvassing. Respondent had had information to be on his guard. Ross had given up his job on May 22nd or 23rd, 1930, and Smith had been appointed in his place. Smith had sometimes had help from a man named Jackson, and both of them had had practically weekly instructions to be on their guard against any suspicion of canvassing. There were at present about 530 or 540 families on the club, and of these families

there were 217 adult patients on his panel. There must be over 1000 panel connexions of the children who were on his club. At the moment Jackson was not collecting; Smith was collecting a little, and the rest was being done by his own chauffeur. He had accepted Cherry as a panel patient on July 21st, 1930, the card having been handed in by Smith or Jackson. He had fixed the date by information supplied recently by the Surrey Insurance Committee. The children had first joined the club on July 11th, 1930, and had been attended by him on August 19th, 20th, and 22nd, 1930. He had never seen Cherry or had any complaint from him. The family had ceased to be members of the club on Nov. 22nd, but Cherry was still on his panel.

He had spoken to Mrs. Lester three times: on Oct. 27th and 29th, 1930, and on Sept. 14th, 1931. She could not have called for medicine, as his wife did the dispensing and would have seen her. On the second occasion that she was supposed to have called, he had been ill in bed with a locum tenens in charge. It was not true that he had asked her to get her husband and stepson to become his panel patients. He presumed that she had a husband, but had never heard of the existence of a stepson. He had never asked her about her husband. Her evidence was absolutely untrue. On Sept. 14th, he had been making a call, and his wife had been driving the car. As he had returned to it he had seen a woman holding the side of the car; he had not known her. His wife had said, "Mrs. Lester wants to know if her daughter—the epileptic—who has now reached the age of 16, can become a panel patient." He had said, "No, not unless she has entered insurable employment." He had then stepped into the car and said to his wife, "For God's sake, drive on," because he had been in a hurry and had not thought it safe, in existing circumstances, for him to allow any stranger to talk to him about panel matters.

In the reply to the Legal Assessor, he said that there had been nobody about who could have overheard the conversation.

Further examined, he characterised Mrs. Lester as a woman of unbalanced mind. He said that Mrs. Goldring had come to his surgery on June 10th, 1930, as a private patient, with her child; she had inquired the tariff of the club, but her husband had not been mentioned. It had never been a condition that the husband should go on the panel. The respondent had said that he would send his collector on the Saturday; that was his usual formula when patients decided to join the club. He had not made derogatory remarks about Dr. Davidson; he had told her that the principle of homœopathy was extreme dilution of the medicament used. He did not remember any conversation with Mrs. Robinson, but it was not true that he had asked her to get her husband to join the panel. Arthur Robinson had been accepted on his panel on Feb. 14th, 1930, but he did not know how the card had reached him.

Cross-examined by Mr. Shawcross.

He stated that he had first been qualified in 1892; he had first been in general practice as an assistant in Cardiff, where he had remained for about three years. From there he had gone to Dinas Powis, where he had practised on his own account in a new locality for about 15 years.

Q. I suppose that during that time you acquired a very large and considerable practice?—A. Not very large; I made a living. Q. What would be approximately the date of your leaving that practice?—A. It would be the date when I came to Kingston, when my present wife and I eloped together and waited for divorce proceedings to mature before we got legally married. For that incident I was adjudged by this Council to have been guilty of infamous conduct in a professional respect, and I was for two years off the Register.

Continuing, he stated that the incident had been the reason for his leaving his practice in Wales. He had become a locum tenens in Birmingham on the day after his name had been restored to the Register, and thereafter had started practice at Risca in Monmouthshire. After six years he had sold that practice for about £2000 and gone to Treherbert, where he had had a good practice; he had left that place for Kingston on account of its inconvenience and because he and his wife were both tired of living in a backward colliery locality. His Kingston practice had grown very rapidly; this he attributed to the facts that he had been well known from his previous residence; had spent a good deal of money in equipping attractive surgery premises at a strategic site; had had many recommendations from old patients; and had made no distinction between panel and private patients. His wife had helped him ever since the previous proceedings and had been a very valuable factor. He could, moreover, claim a certain amount of ability, and he charged small fees and did not book any attendances. His reputation in Kingston had been, he agreed, the most valuable factor in his rapid success. He had called on Dr. Goffe, whom he knew to have acquired his own old practice, and had tentatively suggested partnership, but Dr. Goffe had said that he was tired of partners. He admitted that his new surgery was three minutes' walk from Dr. Goffe's lock-up surgery, but there was no resident opposition in the neighbourhood. He had had family medical clubs before, at Dinas Powis, Risca, and Kingston.

In his experience it had been quite a general practice to give permanent employment to men to collect fees from poor patients. He paid his collectors 2*s.* in the £ for collecting the money and 1*s.* for services rendered in the enrolment of new members. These services consisted of taking the names of the family, writing them out on a card, bringing in particulars, and filling up a loose-leaf ledger with the amount contributed each week. Patients would join the club by coming to his surgery and leaving their names and addresses; he would then send the collector to enrol them. There was no room for the collector to work on the premises; the collectors came on Saturday evenings to bring particulars of new patients. His collectors had been cautioned week by week, and were subject to instant dismissal if they approached a stranger with a request to join the club. He had cautioned them strongly because he knew he was being watched, as a cat watches a mouse, by his professional neighbours. The complainants had been accosting patients in the street and asking them for particulars of their connexion with him. One of the doctors had said that the respondent had been hounded out of Kingston once and that the complainants would take good care that he was hounded out again. The whole town had been canvassed for this inquiry, and, out of 1500 panel patients and 500 odd club patients, the amount of testimony procurable did not seem a very large proportion. He believed it to be absolutely impossible that the collectors should have canvassed on his behalf.

Six o'clock having arrived, Mr. Davis asked to be

allowed to call Mr. Hewson, who was present but who would probably not be able to attend next day. The Council refused.

On Saturday morning Dr. Roche was questioned by the Legal Assessor and repeated his previous evidence. He admitted that some club patients had come to him through the collector, and not vice versa, but maintained that in these cases the introduction had first been effected through a patient who was already a member, and said that he could give a satisfactory account of the way in which every member had come to belong. In the circumstances in which the club was conducted he did not think the shilling constituted a temptation to the collector to increase the membership by improper methods.

THE COLLECTOR'S EVIDENCE.

Mr. Charles Edward Smith said that he had become collector for Dr. Roche about May, 1930, and he and his family had previously been patients. He had been supplied with names to call on by Dr. Roche, and as he had become better known he had been applied to from time to time by members of the club to enrol their friends. He had frequently been warned by respondent of the seriousness of approaching persons to join the club without such an introduction. He had heard of Mrs. Cherry from Mr. Hewson, who had told him that she wanted to join, and he had sent Jackson to call on her. He had never asked anybody to join the club or to transfer to Dr. Roche's panel. He had never been instructed that a family could only join if a parent was on the panel. He had worked for Dr. Roche in his spare time, making on an average 10*s*. a week, about 2*s*. to 6*s*. of which came from new patients. He was also employed as agent and collector for a firm of coal merchants.

He explained that Jackson, who had been present the day before, was unable, on account of work, to attend that day to give evidence.

Mrs. Florence Emily Roche confirmed her husband's account of the episode of Mrs. Lester and the car, and said that she knew of no condition that to be a member of the club the family must have a parent on the panel.

SPEECH FOR THE DEFENCE.

Mr. Davis said: "An attempt has been made to throw such an atmosphere of prejudice round the case as entirely to detract from the specific instances. You have before you four specific instances, and those I ask you to deal with upon their merits; I ask for nothing more. This is not a case where one professional man hears of an impropriety and makes his investigations impartially and then takes the usual steps. It is a case where patients have been definitely approached in order to try and track down any impropriety, not in one instance but in many instances. Indeed, the witnesses have admitted that doctors have been to ask them."

Mr. Davis then dealt with the case of Cherry, concluding: "That comprises the evidence on the first charge."

Mr. Shaweross: "There is only one charge, and these are particular instances." Later Mr. Shaweross said again, "I am under the impression that there is only one charge: 'That being a registered medical practitioner, you have . . . . canvassed with a view to obtaining patients.' That is the charge; if there is any other, I do not know of it."

The Legal Assessor: "You had better read the rest of it."

Mr. Shaweross: "Then it goes on to say, 'And in particular . . .' and what follows are merely particular instances."

The Legal Assessor: "These are particulars of the charge, and they are so treated by this Council as being specific instances that have to be dealt with, and evidence on which has to be given."

Mr. Shaweross: "I quite appreciate that, but I am sorry to say that I did not appreciate that they were to be regarded as separate charges. My friend talks about separate charges, and not proceeding with such and such a charge and so on."

The Legal Assessor: "You are probably familiar with the usual practice in other places: that where you make a general charge you are called upon to give particulars, and when you have given particulars you are bound by those particulars, and are not entitled to go beyond them. These are particulars of the general charge and the charge is therefore limited to these particulars . . . ."

Mr. Shaweross: "I purposely interrupted my friend when he said there were six charges; I may have been somewhat mistaken about that but, as I see it, there is one charge with respect to which there are six particular instances. If that is wrong, then I suppose I ought to deal with each charge separately."

The Legal Assessor: "I think you ought to deal with each charge separately."

Mr. Davis then continued to deal with the witnesses, and pointed out the contradiction of evidence and the confusion of recollection in each case.

Mr. Shaweross then addressed the Council.

THE JUDGMENT.

After deliberation in camera, the President announced the decision of the Council in the following words:—

"Mr. Thomas Francis Roche: I have to inform you that the facts alleged against you in items (1), (2), (5), (6), and (7) in the Notice of Enquiry have been proved to the satisfaction of the Council. In respect of these facts, the Council have now adjudged you to have been guilty of infamous conduct in a professional respect, and have directed the Registrar to erase from the Medical Register the name of Thomas Francis Roche."

MEDICINE AND THE LAW.

Needle Broken During Injection: Allegation of Negligence Fails.

THE breaking of a needle in the process of injection is not necessarily negligence. The practitioner does not insure his patients against accidents; if the needle is broken and injury is consequently suffered, the practitioner cannot be made to pay damages unless negligence is proved. At the Camelford county court on Nov. 18th last allegations of negligence were made; but the judge, holding that they were not proved, dismissed the patient's action for damages. The plaintiff was suffering from disseminated sclerosis. She was treated with intramuscular injections of sulfarsenol in the right buttock from July, 1927, onwards. At the thirty-fifth of the series (in May, 1929) the needle broke. It was common ground that the doctor at once endeavoured to remove the broken piece. He immediately made a small incision under local anæsthetic. When this operation did not succeed, he forthwith had the patient removed to a nursing home where a larger incision was made the

same evening under a general anæsthetic. The missing piece of needle was not found. Next day, and again two days later, X ray photographs were taken and further probing took place under local anæsthetic. These efforts were in vain. Two months later the patient left the nursing home. Her treatment continued but it has not been possible to localise and remove the broken needle. Subsequently the patient claimed damages for negligence, which were resisted by the London and Counties Medical Protection Society.

The claim was put forward in two ways. First, it was said, the injection had been made in a hurry and carelessly; the doctor must either have used a defective needle or must have struck a bone; these allegations would establish negligence in the act of making the injection. Secondly, it was said that he negligently failed to remove the fragment. The patient in the witness-box said the doctor had been hurried in his manner and this particular injection seemed to have gone deeper and had given her much more pain than ever before. A general practitioner, giving evidence on the plaintiff's behalf, produced X ray photographs proving the presence of the fragment in her body. His testimony was otherwise inconclusive. He said the needle might have been defective but he did not know what needle was used nor had he himself ever treated a patient for this disease. He said the needle might have been broken by striking a bone; to strike a bone would, he considered, have been negligent. If the breaking was not due to defect or to striking a bone, it might, he thought, be due to a violent twitching of the muscle by the patient. On the second branch of the case (negligent failure to remove the fragment) this medical witness for the plaintiff said there should have been an operation for removal; the operation could have been—he would not say ought to have been—successful; if it failed, it should have been repeated at the proper time, but he could not say what would have been the proper time. There was also a suggestion that if the defendant did not possess the best possible apparatus for localising the fragment, he should have sent the patient to Plymouth or any other large centre where special facilities existed.

At the close of plaintiff's case the learned judge was asked to rule that there was no evidence of negligence. With some hesitation he allowed the action to proceed. The defendant doctor then gave evidence describing what had occurred. He denied hurry and explained that, when the patient's muscle was bunched up for the injection, there was a muscular twitch which had the effect of breaking the needle. The needle used was a proper one. As little now remained of the allegations of negligence, plaintiff's counsel was reduced to arguing that the fact of the doctor having given free treatment to the patient in a nursing home was evidence of an admission of liability for negligence. The judge declined to accept this and said it was more easily explained as a generous act. The judge expressed sympathy for the plaintiff, but said he could find no want of the skill expected of a medical practitioner. "The mere fact of the needle breaking is not necessarily negligence; it might have been a defective needle; it might have been broken by some movement of the patient; it might have been broken because the defendant carelessly and clumsily reached the bone." This last possibility was not proved; it could not outweigh the other two possibilities. He thought the defendant's own evidence probably excluded the possibility of his being found negligent. If, continued the judge, the evidence was equally consistent with neglect and with no neglect, the plaintiff could not possibly succeed in her action.

This claim recalls an Australian case, noted in THE LANCET last year (August 23rd, 1930, p. 421) where the defendant doctor attributed the breaking of a needle to a fit of coughing. It was a feature of the Australian case that the doctor, for reasons which he gave, omitted to inform the patient of the accident. Such reasons may exist but a jury would probably draw an adverse conclusion from non-disclosure. Earlier in 1930 (May 17th, p. 1083) THE LANCET had published certain possible precautions for minimising the risk of broken needles. The practitioner will naturally desire to avoid accident by all means in his power, but he is not liable for undiscoverable flaws in the instruments he uses nor is he expected to have expert metallurgical knowledge of the qualities and testing of a needle.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 1214.*)

A post-mortem room attendant gave evidence that he was surprised to find intestinal tuberculosis in so many children. When the judge expressed astonishment at an unqualified attendant performing autopsies the expert witnesses stated that it was usual in certain cases for the routine work to be performed by an attendant whilst the pathologist gave his opinion on the condition found in the organs. Counsel for the parents thereupon remarked that nurses and other unqualified people, and the parents themselves, had from the beginning ascertained that the children had died from the BCG; only the physicians had not become aware of it. He wanted to know whether the stock of human bacilli received from Kiel was highly virulent because, according to Prof. Deycke's evidence, they had served for the preparation of the Deycke-Much partigen. Was it not in Prof. Deycke's view useful to increase the effect of the BCG by the addition of a quantity of human bacilli? Had not Prof. Ascoli of Milan called "super vaccine" the preparation produced by Prof. Deycke? Dr. Wosnitza, a Lübeck practitioner, gave evidence that he could not say positively that he had remarked to Dr. Jannasch: "Your Calmette stuff is nonsense; it makes the children ill." He admitted saying that the children had a bad complexion and skin rashes, and were put off their food. Dr. Jannasch replied that these were normal and expected reactions.

Counsel for Dr. Altstädt then stated that up to October, 1930, more than a million children in many countries had been treated with BCG vaccine without harm, and he asked for the production in court of the records of the German Health Office and testimony taken from medical men abroad including Japan, Cuba, and Uruguay. The public prosecutor said that to do this a member of the court would have to travel over the world and it would require years to obtain the evidence. If a million of children had been treated with BCG without harm why, asked Counsel for the parents, had this not been the case in Lübeck? He proposed to prove that the reason was a spoiling of the original preparation. Dr. Rissen, president of the Lübeck Medical Society, said he had told Dr. Altstädt it would not be wise to introduce a preparation from abroad, especially with such speed, without a thorough

examination by a competent German authority. The editor of a Lübeck paper gave evidence that Prof. Klotz had told him after the disaster that he had warned against a continuation of the administration of the B C G, but that his warning had been disregarded. He was also told that Prof. Lange, of the German Health Office, had declared his journey to Lübeck for the purpose of inquiry superfluous because the cultures had been destroyed. Prof. Klotz had said to him that the B C G was innocuous but that the preparation used in Lübeck was not B C G. Examined by the public prosecutor, Prof. Klotz declared he had meant by that remark that something alien had been mixed with the B C G or that it had become virulent.

Nurses from the Children's Hospital gave evidence that on April 26th the emulsions were collected from them and other tubes distributed without any explanation. The new tubes proved to contain not the B C G emulsion but the Deycke-Much partigen. They were not informed that the original tubes had been withdrawn because of undesirable effects caused by them. Dr. Eicke and Dr. Jannasch, assistant physicians at the hospital, stated that all the children who became ill or died within the first days had received the emulsion distributed on Feb. 28th. They were of opinion that only that particular emulsion had been spoiled, not the entire stock. Senator Eckhold, vice-chairman of the Lübeck Health Council, reported that Dr. Altstädt had informed him on May 6th of the accidents caused by the B C G after four fatal cases had happened. A meeting of the Health Council was then convoked, at which it was decided to stop the application of the Calmette method at once, to inform the German Health Office, the Lübeck Senate, the public prosecutor, the mothers of the infants, and the press. Prof. Deycke, he said, was a conscientious and efficient physician, very popular with the patients who, on his suspension by the Senate, petitioned that authority to let him carry on his hospital work. Since his suspension there were more complaints than before. He could not believe Deycke capable of harming his patients from a mere desire for research.

Dr. Altstädt, on being asked why he had not informed the health authority before May 6th, replied that like the hospital physicians he had thought that only one emulsion had been spoiled; as soon as an infant treated with any other tube had become ill he informed Senator Eckhold. He did not wish to alarm the public by the statement of a fact which was very likely accidental.

A particular case was then pleaded before the court. A child after having been treated by an emulsion prepared in Prof. Deycke's laboratory three months before the official introduction of the B C G showed afterwards symptoms of tuberculosis. A piece of a cervical gland was removed and shown to Dr. Jannasch who had the special care of the tuberculous patients in the hospital. Dr. Jannasch gave his opinion that this was a rare case of congenital tuberculosis; Prof. Deycke and other Lübeck physicians agreed with him. Only later on when many children had become ill and some had died after the administration of the B C G had Prof. Lange, of the German Health Office, stated that the tuberculosis in this child was just the same as in the other children. He had remarked to Dr. Altstädt that perhaps the whole disaster might have been avoided if the physicians had not only considered the possibility of congenital tuberculosis but of tuberculosis acquired by the treatment.

THE SERVICES

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. W. H. Foy to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

TERRITORIAL ARMY.

Lt. A. A. Allison to be Capt.

Supernumerary for Service with the O.T.C.—Maj. O. H. Mavor resigns his commn. and retains his rank.

INDIAN MEDICAL SERVICE.

Lt.-Col. W. C. Gray retires.

ROYAL AIR FORCE.

Flying Officer H. T. Rylance relinquishes his temporary commission on completion of service.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer M. D. Rawkins is transferred from Class D (ii) to Class D (i).

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 28TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 56 (last week 55); scarlet fever, 2012; diphtheria, 1103; enteric fever, 33; pneumonia, 1120; puerperal fever, 39; puerperal pyrexia, 110; cerebro-spinal fever, 20; acute poliomyelitis, 5; encephalitis lethargica, 11; continued fever, 1; dysentery, 16; ophthalmia neonatorum, 91. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 1st–2nd was as follows: Small-pox, 112 under treatment, 13 under observation (last week 120 and 3 respectively); scarlet fever, 1644; diphtheria, 1565; enteric fever, 10; measles, 348; whooping-cough, 424; puerperal fever, 15 (plus 13 babies); encephalitis lethargica, 221; poliomyelitis, 5; "other diseases," 181. At St. Margaret's Hospital there were 12 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 35 (2) from measles, 4 (1) from scarlet fever, 27 (6) from whooping-cough, 31 (3) from diphtheria, 60 (15) from diarrhœa and enteritis under two years, and 91 (8) from influenza. The figures in parentheses are those for London itself.

Seven deaths from measles were reported from Stoke-on-Trent, 5 from Bolton, 4 from Carlisle, 3 each from Manchester and Halifax. Liverpool reported 6 deaths from whooping-cough, Walsall 3. Diphtheria claimed 9 victims at Leeds, 3 at Manchester. Diarrhœa was credited with 9 deaths at Liverpool, 4 at Birmingham, 3 at Plymouth. The fatal cases of influenza are reported from 44 great towns, the highest numbers being in Liverpool 6, Wigan and Manchester each 5, Bolton, Rochdale, and Burnley each 4.

The number of stillbirths notified during the week was 237 (corresponding to a rate of 40 per 1000 births), including 47 in London.

PROGRESS OF MIDDLESEX HOSPITAL.—At a special meeting of the Governors, on Dec. 9th, Prince Arthur of Connaught said that the Middlesex Hospital was now in sight of the end of its reconstruction scheme. The new west wing and other new wards were in use, as well as the new operating theatres and special services, while part of the new out-patient department was in commission. The Courtauld Institute and the Ferens Institute had already amply justified their founders, the splendid new nurses' home had come into being, and three outlying blocks of buildings had been linked by subways. Private rooms for paying patients had been in use for the past two years, and work was continuing on the Woolavington block with its 60 rooms and its two operating theatres. A large sum of money was still required to complete the work, but it would be forthcoming, for already during the past year £27,000 had been received in quite small sums. It had been decided to carry on with the final section of the work, step by step, as was justified by the funds.

CORRESPONDENCE

CONTACT INFECTION IN POLIOMYELITIS.

To the Editor of THE LANCET.

SIR,—I was particularly interested in Dr. Salusbury MacNalty's note in your issue of Nov. 28th, for my own observations confirm his opinion that acute anterior poliomyelitis may be spread by direct contact. During the epidemic in England in 1926 I saw over 150 cases, both in public and private practice. In one particular district in Grays in Essex it was proved conclusively that the infection travelled by direct contact, probably by the secretions of the mouth, nose, and throat. For example, more than one case occurred in one family or house, and often cases occurred in families living next door to one another.

Out of the epidemic emerged the following facts: (1) The incubation period appeared to be ten days. (2) The diagnosis was not always easy, for in the early stages the disease resembled influenzal and pneumococcal infection. (3) The prognosis was exceedingly difficult, and great caution was therefore necessary. For example, a brother and sister were equally afflicted with paralysis: one recovered completely and the other died. (4) Antiserum was obtained at once from patients of mine who had in the past developed the disease. (Here, I may say, there was no lack of volunteers.) In certain institutions the injection of this serum appeared to diminish the severity of the paralysis. In fact, my colleagues and I arranged mutually to be injected prophylactically should any of us develop the early signs and symptoms of the disease. (5) Immunity against the disease did not appear to be hereditary, as it is in small-pox. For example, the fact that a father had had poliomyelitis some years beforehand did not prevent his little daughter from having the disease some years later. (6) Certain of the cases developed a definite vesicular eruption of the nature of herpes, often over the particular nerve area involved. (7) Immediate orthopædic treatment saved a great deal of pain, allowed the patient to sleep, and often led to recovery of paralysis. I believe, too, that in certain cases it actually saved life.

I regret that I have not up to the present time reported these observations, but I hope to amplify them at an early date.

I am, Sir, yours faithfully,

B. WHITCHURCH HOWELL, F.R.C.S.

Harley-street, W., Nov. 31st, 1931.

LONDON CLINIC AND NURSING HOME.

To the Editor of THE LANCET.

SIR,—The London Clinic and Nursing Home is now nearing completion, and it is hoped that it will be open for the reception of patients early in January. In view of the dimensions and novelty of the undertaking, we regard it as of the greatest importance that its aims should be clearly understood and the means by which it is hoped to achieve them.

The Nursing Home will contain 200 separate rooms, and these will be available for the patients of any registered medical practitioner, who may look after his patients and call in the services of any consultant with precisely the same freedom as he would enjoy in any ordinary nursing home. He will, in addition, have the advantages of all the resources of a modern hospital. It is, of course, obvious that the use of the operating theatres for major surgical procedures must be limited to surgeons on the staff of recognised hospitals.

The charges for the rooms will range from 7 guineas a week according to the accommodation required, and every effort will be made to make these charges as inclusive as possible.

Attached to the Nursing Home is a block of 36 consulting rooms, occupied by members of the medical group to whose enterprise the Nursing Home owes its existence, and who will be responsible for its organisation, although they have no concern in its finance. Their own relations are best described by the paragraph of their Articles of Association that—

> "Every member of the Group shall have the right to carry on his private practice in his consulting room without any restriction and for his own benefit. In particular, he may call in and have the advice and coöperation of any duly qualified medical practitioner, surgeon or dentist, whether a member of the Group or not."

It is obvious that an undertaking of these dimensions, involving the capital outlay of nearly half a million sterling, cannot be carried out without an organised control. We have, however, endeavoured to combine the coördination which is essential to the success of any business undertaking with the liberty which has always been such a characteristic feature of British medical practice.

We are, Sir, yours faithfully,

H. MORELAND MCCREA (*Chairman*), Sir LENTHAL CHEATLE (*Vice-Chairman*), A. P. BEDDARD, W. ROWLEY BRISTOW, HAROLD D. GILLIES, WALTER HOWARTH, P. MANSON-BAHR, H. S. SOUTTAR, A. J. WALTON.

Executive Committee to the Medical Advisory Board.

Dec. 7th, 1931.

CANCER OF THE CERVIX.

To the Editor of THE LANCET.

SIR,—The point at issue in this correspondence is really whether there is any justification for calling a cancer of the cervix a squamous epithelioma in the absence of any cytological evidence of a squamous-celled growth or of evidence of its origin from squamous epithelium. My contention is that there is none, and that even though we can trace the origin of the tumour to the basal cell layer, in the absence of even the slightest visible differentiation, we are not justified in calling it anything but a basal-celled cancer.

No one would be foolish enough to deny that from the basal cell layer malignant cells of more highly differentiated type—prickle, granular, and horny—may develop. Even in the cervix this often happens. But if such development fails there is no reason why the tumour should be called a squamous epithelioma. Then in the majority of cases it is impossible because of the advanced state of the growth to trace its origin. Why, if in such a case there is at the same time no cytological evidence of a squamous epithelioma, such as prickle cell formation, it should be assumed that it is a squamous-celled cancer, passes my comprehension. If it pleases Prof. Kettle better, I am willing to do as he suggests and call it carcinoma simplex, which he frankly admits is all the name it merits. This is a name that would suit a large number of them, but I think he will generally find that the quantity of stroma and the cell grouping are such as to render preferable the term I have used—solid alveolar cancer. In the breast in which this tumour

is seen to perfection there is no question of its origin from squamous epithelium. Why then should such an origin be always assumed in the cervic uteri? Further, if anyone will sit down, and, with an open mind and an oil immersion lens, examine any large number of sections of cancer of the cervix he will, I contend, find that about 70 per cent. belong to this group.

It is a curious fact that the majority of men who are born or brought up to a given belief demand the most rigorous proof of any adverse belief, but assume that their own needs none.

I am, Sir, yours faithfully,

London, W.C., Dec. 7th, 1931. F. J. BROWNE.

ACTIVE IMMUNISATION IN VIRUS DISEASES.

To the Editor of THE LANCET.

SIR,—In the report of a discussion on this subject in your issue of Dec. 5th (p. 1241) I am stated to have said "that the possible persistence of infectivity of a dog *after immunisation* to distemper . . . became a serious consideration in hospital." (Italics mine.) This would bear the interpretation that I feared that immune dogs might be carriers of distemper infection, and that is a matter that I did not raise in the discussion. The point I brought forward arose from the view expressed by Dr. Andrewes, who opened the discussion, relative to the possibility of a dog in the process of immunisation being capable of spreading infective material. He considered it would probably not be of much importance because of the widespread occurrence of infective material under street conditions. I pointed out, however, that it was of considerable importance whether or not a dog in hospital eliminated virus *during the process of active immunisation* on account of the possible danger to young susceptible dogs in the hospital or kennels at the same time. I shall be glad if you will allow me to make this correction, as I have no reason to suspect that vaccinated dogs remain carriers of infection afterwards.

I am, Sir, yours faithfully,

GEO. H. WOOLDRIDGE.

Royal Veterinary College, Camden Town, N.W., Dec. 7th, 1931.

MEASLES.

To the Editor of THE LANCET.

SIR,—In his reply to my letter (Nov. 14th, p. 1159) Dr. Bedson takes the view that seeing an attack can be prevented from developing in an infected child, therefore measles is preventable. He appears to disregard the fact that although the child escapes on that occasion, the attack is simply delayed, that in a month the child is as liable to attack as before, and that sooner or later it will be attacked. Seeing that the attack is only delayed, from the point of view of the epidemiologist Dr. Bedson is wrong in stating that measles is preventable.

I have no wish to argue about words so long as my meaning is perfectly understood, and in case I have not expressed myself clearly, I hope you will allow me to restate what I said regarding the exclusion of contacts. My argument is that seeing that measles, even when home contacts are rigorously excluded, spreads through a school attacking or immunising by minimal infections all scholars not already immune, the present rules excluding home contacts from infected departments are a waste of both time and money, neither of which can be afforded at the present time. It is because we are not honest enough to admit that measles is unpreventable that these rules are continued, their continuation leading the parents to believe that the spread of measles is in some measure being controlled. I am glad that at last parents have been told the truth, which will leave medical officers of health freer to discard useless rules with regard to exclusion.

Whilst I see no useful future for convalescent serum in eradicating measles, I can quite share Dr. Bedson's enthusiasm for convalescent serum treatment as an agent to delay attack until school age, and I only hope that the present limited supplies of convalescent serum may be used to the best advantage. May I suggest that health departments may be of service in the following way? In most towns children absent from school suffering from measles and cases of measles occurring in creches are notified to the medical officer of health and are at once visited. The medical officer of health in this way is informed of all home and creche contacts, and could arrange for the serum treatment of as many contacts as the quantity of serum at his disposal allowed; he would naturally give preference to the age-groups in which case mortality was highest, beginning with the 9–18 month groups.

I think Dr. Bedson will find that the very men who most resent their time being wasted in preparing useless lists as to which school-children have, and which school-children have not had measles, and in excluding contacts to no purpose, are the men most eager to take advantage of the great benefits likely to follow the wide use of convalescent serum for selected age-groups.

I am, Sir, yours faithfully,

DUNCAN FORBES,

Dec. 3rd, 1931. Medical Officer of Health, Brighton.

*** Dr. Forbes is rightly anxious to explode the belief that a person can escape measles by avoiding contacts. Dr. Bedson wants to explode the other prevalent belief—that the medical profession is helpless in face of this disease. We still think it misleading to call an infection "almost wholly unpreventable" if one can be pretty sure of preventing it (though temporarily) in a particular case, and if permanent immunity can be conferred (as in small-pox) by a modified attack. All that matters, however, is that these prophylactic methods should be applied to the best advantage, and we welcome Dr. Forbes's declaration of policy.—ED. L.

RESEARCH IN ASTHMA.

THE URINARY PROTEOSE.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 28th I gave some results of mine which make it difficult to accept as proven the specificity of Dr. Oriel's proteose; in your last issue Dr. Barber and Dr. Oriel write to protest. If I understand the first half of Dr. Barber's long and interesting letter, I had no right to look for, or at any rate to expect to find, evidence of specific sensitisation by the usual intradermal injection; there might, on the contrary, be only a reaction from an epidermal patch test, and this might occur in this place but not in that place, and on this day but not on that day; or else again the patient might not react on the dermis or epidermis at all but only, let us say, in the lungs. My reply is that I looked for intradermal specific reactions with "pro-

teose" because we had been told that we should find them; further, when Dr. Oriel was told that these intradermal tests of mine had not come off, he did *not* say that the skin might not be sensitised but some other part of the body. I may now add that when invited to Guy's Hospital last week by Dr. Poulton to be taught the error of my ways, it was by the intradermal test only that he and Dr. Oriel tried to convince me. If we are now to take Dr. Barber's opinion that positive dermal reactions are only to be obtained occasionally, it would certainly explain all failures, but it seems to me to put this proteose business on a different footing to the dermal tests for, let us say, horse-asthma or hay-fever.

These dermal reactions, if we may shut our eyes to Dr. Barber's suggestion of fortuitousness, clearly demand thorough investigation; but my experiences at Guy's Hospital last week told me that Dr. Poulton and Dr. Oriel are looking for slighter changes than I have been accustomed to call positive reactions. They confirm also my previous opinion that the proteoses they are working with are liable to be toxic, and so to produce "reactions" on the normal man's skin. Dr. Oriel, working with hay-fever proteose, had, on the balance, the better of me at that meeting, in that he got two very minimal "reactions" on two hay-fever people tested, and only got a "reaction" on one of the three normal controls. On the other hand, Dr. Poulton, in demonstrating on a presumably selected case of asthma-eczema with its own proteose, produced not only a reaction on him but also three equivalent reactions on the three normals tested. When we note how all these "proteoses" tend to be tainted with general toxicity (not surprising since they have been carefully excreted by the kidneys), and remember how much more prone to react is the skin of the asthma group of patients than the skin of the normal man, the door is seen to be wide open for a whole number of confusing results.

Dr. Barber complains that I did not refer to Dr. Oriel's guinea-pig uterus experiments; naturally I only wrote on my own first-hand evidence with proteose. If I might refer to these experiments without first-hand knowledge of them, I would say at once that they are very suggestive and ingenious. The anaphylactic uterus is employed as a piece of litmus to test out the identity of proteose with this or that food substance. The laborious and complicated nature of the work would, however, seem to make it difficult to do adequate controls and would give an opening for accidental results; I find myself, in reading of them, saying, "I wonder if he did this control," "I wonder if he had any results going the wrong way." I hesitate to write that comment because it seems a niggardly recognition of a great deal of very ingenious work. Five years ago Dr. D. M. Thomas and I attempted to sensitise passively 30 guinea-pigs, most of them with serum from hay-fever patients, but some with serum from horse-asthma cases. We tried a variety of methods but did not succeed in sensitising any one of the guinea-pigs to pollen or to horse dandruff, as judged either by dermal reactions or by Dale's uterus technique.

With regard to Dr. Barber's clinical evidence, it is always difficult to ascribe with certainty a "reaction" to this or that dose, and never more so than in patients of the asthma type. I have got such dramatic "reactions" after control injections of normal saline that I distrust such clinical evidence. Dr. Barber's warning that it may be dangerous to use more than a fortieth of a cubic centimetre of a hundred-million-fold dilution of proteose, gives me a shock when I reflect that I injected a twentieth of a cubic centimetre of what I believe was the undiluted proteose prepared by Dr. Oriel, and got absolutely no effect with it either local or general. If we accept Dr. Barber's clinical evidence, then the fact that reactions occur usually on the third day after his dose again suggests very strongly that this business is not comparable to, say, horse-asthma or egg-sensitiveness.

Turning to Dr. Oriel's letter, it is interesting to learn that the proteose made by him, which had failed to react intradermally on my asthma-eczema patient who had produced it, was subsequently used to make a guinea-pig typically anaphylactic; this shows that, whether or not it reacted specifically on my patient, it was at any rate capable of functioning as an antigen.

The difficulties stated in my original letter have not been, for me at least, removed. I think we may say that the proteose reactions do *not* stand on the same footing as, for instance, the pollen dermal reactions for hay-fever. Though the work on the proteoses is interesting and suggestive, I would regard their character as still sub-judice.

I am, Sir, yours faithfully,

JOHN FREEMAN.

Devonshire-place, W., Dec. 8th, 1931.

SCIENTIFIC POST-MORTEM EXAMINATION OF PEDIGREE ANIMALS.

To the Editor of THE LANCET.

SIR,—In reading issues of that historical sporting paper the *Field* I have been struck by the certainty with which the pedigrees of all kinds of animals can be traced through many generations. I wonder whether the causes of death in past generations have been authoritatively and accurately recorded as the pedigrees. These records—if such be in existence—would contain a wealth of material to all those interested in the relations of heredity, eugenics, and disease. If the death certificates are untrustworthy there has been an enormous waste of information, and it is high time attention should be paid to this matter. Far be it from me to suggest that the Medical Research Council should interest itself in sporting and agricultural matters in general; but this inquiry seems to me to be one that comes within the province of a useful scientific investigation.

I am, Sir, yours faithfully,

G. LENTHAL CHEATLE.

Harley-street, W., Dec. 7th, 1931.

FEMALE CIRCUMCISION.

To the Editor of THE LANCET.

SIR,—In the valuable article on Female Circumcision and Infibulation, by Dr. J. H. Sequeira, in your issue of Nov. 7th (p. 1054), the writer infers that the Conference on African Children (organised by the Save the Children Fund, and held last June in Geneva) supported the suggestions which were made by the Duchess of Atholl and telegraphed out to Kenya. As I was a delegate to that Conference, I would be grateful if you would allow me to explain that these suggestions were not supported by the full Conference. Towards the end of it, the committee appointed to draw up the final statement on infant mortality defeated the suggestion made by one of its members that Governments should be asked to pass legislation to prohibit female circumcision, the majority of

members being of the opinion that education through schools, native councils, and nurses was the only safe and permanent way of dealing with the problem, and that direct legislative prohibition by an alien race would only have a very partial effect in stopping the practice, which would be driven underground.

As a result of the committee's decision, the Conference in final plenary session made no suggestion whatever as to any legislation to deal with this question. The final statement of the Conference may be obtained from the secretary of the Save the Children Fund, 26, Gordon-street, London, W.C. 1, and a book on the Conference entitled "The African Child," by Evelyn Sharp, is obtainable at the same address for 2*s*. 6*d*.

I am, Sir, yours faithfully,

ISABEL ROSS, B.A.

London, N.W., Dec. 4th, 1931. (formerly of Kenya Colony).

BRUCELLA ABORTUS INFECTION.

To the Editor of THE LANCET.

SIR,—I read with interest the case described by Dr. F. Bedo Hobbs in your issue of Sept. 26th (p. 683). Cultures of *Br. melitensis*, especially when they have been subcultured many times, are very liable to agglutinate in fairly high dilution with sera of patients who have had pyrexia over a long period. This phenomenon is often very marked in streptococcal infections. I have known the sera of patients with subacute endocarditis to agglutinate stock cultures of *Br. melitensis* in much higher dilutions than those mentioned by Dr. Hobbs. The agglutination test in undulant fever has considerably less value than in the enteric fevers. The chart shows that *Br. melitensis* and *Br. abortus* were not agglutinated in dilutions of 1 in 25, but were agglutinated in somewhat higher dilutions. If this chart is accepted as of any diagnostic value, then a large proportion of cases of continued obscure fevers may be diagnosed as *Br. abortus* infections.

I am, Sir, yours faithfully,

LUCIUS NICHOLLS,
Director,

Nov. 16th, 1931. Bacteriological Institute, Ceylon.

PSYCHOLOGICAL ASPECTS OF GYNÆCOLOGY.

THE ARTIFICIAL CLIMACTERIC.

To the Editor of THE LANCET.

SIR,—In connexion with the question of the sterilisation of women raised by Dr. Crookshank in your issue of Nov. 27th, there is an important point which is, I think, not generally recognised. Many believe that if the ovaries are completely removed the phenomena of the climacteric will not appear, or if they do will end shortly after the operation. I do not know what the effects may be when sterilisation is effected by X rays, but it is certainly not the case where it is the result of operation. I was able to watch the course of events in three cases, two of them trained nurses; in all three I knew the surgeon, and was satisfied that the operation was complete. In all three cases very distinct climacteric symptoms appeared, presumably at the time when they would have appeared apart from surgical interference—viz., about 45. The operations had all been done at least 15 years before. Severe headaches, flushings, and emotional instability were present for some months, and then gradually passed away. One of the nurses, a widow, said that for the first time in her life she had had a sexual dream, a somewhat significant fact. All had had complete amenorrhœa since the operation, and all, I think, supposed they would be exempt from climacteric trouble, so that suggestion is hardly in question.

It would appear that the date of the involutionary processes which we sum up as the climacteric (menopause is a bad term and should be abolished) is more or less set for the individual as are also the age of puberty and the probable duration of life. They may be altered by disturbing environment, illness, and so forth, but in the case of the climacteric the mere removal of the organs in which it finds its most obvious expression does not prevent the accomplishment of other changes largely psychological in character. The menopause is really one of the least important signs of the climacteric, and may antedate the appearance of other symptoms, apart from surgical interference, by a year or two.

I am, Sir, yours faithfully,

E. HOBHOUSE.

Grosvenor-hill, Wimbledon, S.W., Dec. 7th, 1931.

RADIUM BY MOUTH OR INJECTION.

To the Editor of THE LANCET.

SIR,—With reference to the liability to carcinoma of the lung among workers in the metalliferous mines in Saxony, quoted by Dr. R. King Brown, the following extract from the third edition of Osler's Principles and Practice of Medicine (1898, p. 664) is of interest:—

> "It is a remarkable fact that the workers in the Schneeberg Cobalt mines are very liable to primary cancer of the lungs. It is stated that in this region a considerable proportion of all deaths in persons over 40 are due to this disease."

At that time (1898, the date of the Curiès' discovery of radium) the chief product of the mines was cobalt, and the presence of radium in the uranium pitch blende, if then barely recognised, was still less suspected of its part in the causation of lung cancer.

I am, Sir, yours faithfully,

London, S.W., Dec. 5th, 1931. J. GRAHAM FORBES.

MEASUREMENT OF DEAFNESS IN SCHOOL-CHILDREN.

To the Editor of THE LANCET.

SIR,—I should hesitate to challenge the opinion of such an authority as Mr Macleod Yearsley, that "the examination of hearing by spoken numbers is valueless," were it not for the fact that tests on some 5000 children in the elementary schools in the London area have shown that numbers, as used in the way adopted in the routine tests by the gramophone audiometer, have proved to be entirely satisfactory, as judged by the results obtained.

These tests have revealed the important fact that some 6·5 per cent. of elementary school-children, between the ages of 8 and 15, are suffering from deafness in one or both ears, and need special medical examination and treatment. This figure is bad enough when we consider that the ordinary routine medical inspections of school-children, according to the latest figures of the chief medical officer to the Board of Education, only show 0·39 per cent. of children with defective hearing. Yet, were Mr. Yearsley correct in his opinion that the children guess the numbers, and so destroy the value of the audio-

meter test, the percentage suffering from deafness must be even greater than 9·5 per cent.

Experience has shown that attempts to guess are ineffective, and can be easily detected. I fear that Mr. Yearsley has overlooked the fact that, by the gramophone records used with the audiometer, numbers consisting of three digits for any given loudness of speech are used, and the chance of a child guessing them correctly is approximately 500 to 1 against. If single digits were used, the chance of a correct guess might be 9 to 1 against. Moreover, by the audiometer method there is no chance of lip reading by the child, and each ear is tested separately. The particular advantage of numbers consisting of three digits is that three distinct speech sounds are used for testing hearing at various intensities, and the children can easily write down the symbol for these sounds—namely, the digits—without having to bother about spelling a word, which would be the case if words were used.

For very young children, for example in age 4½ to 6, who cannot write, a record using some of the earliest words understood by a child has been prepared. In this case the child is asked to point to a picture of an object when the name is called, the names being transmitted by the headphones to the ear at varying, but standard, degrees of loudness. Even such young children readily coöperate in the test, as almost all of them have tried to listen to wireless through headphones.

Mr. Yearsley's second objection to the audiometer, because it drew attention to a case in which the cause of deafness was found to be wax, is in fact a recommendation. Already many children, with partial deafness due to wax, have had their hearing restored as a direct result of detection by the audiometer, but this would not have happened if the children had not been tested. The detection of hearing defects at the earliest possible age is of paramount importance, and then medical examination and treatment, and possibly special educational care, but the detection of impaired function is the first step towards a solution of the problem of deafness. Permanent damage to the hearing mechanism, and to the health of the child, may have occurred if the defect is not detected before it is obvious to the patient and also to school teachers.

I am, Sir, yours faithfully,

GUY P. CROWDEN.

London School of Hygiene and Tropical Medicine, Keppel-street, W.C., Dec. 8th, 1931.

ASPHYXIA FOLLOWING INJECTION OF TARTAR EMETIC.

To the Editor of THE LANCET.

SIR,—In your issue of Oct. 10th, in a report of a discussion on the problems of asphyxia, cardiac puncture is mentioned as a chief method of resuscitation where the heart has ceased to beat during anæsthesia. On the day before I received that copy of THE LANCET I had to deal with the case described below.

The patient, a female, weighing 52 kg., came to the hospital and was found to harbour *Ascaris lumbricoides* in the intestine, and ova of *Schistosoma hæmatobium* in the urine. Clinical examination showed no contra-indications to tartar emetic treatment for the schistosomiasis, and this was begun by giving her one grain of the drug (6 per cent. solution) intravenously. Soon I was called to see her. I found her thrown on the floor unconscious; the face was cyanosed, the respiration slow, laboured, and superficial, the eyes wide open, and the corneæ insensitive. The pulse could not be felt in either radial or temporal arteries, the extremities were very cold, the heart could not be heard, either with the ear directly or with the stethoscope, and in fact the only sign of life was a very occasional feeble but snoring respiration, occurring not more than three or four times in a minute.

Artificial respiration was at once begun; a mouth gag was inserted and the tongue was drawn forward by a tongue forceps. One milligramme of strychnia and 0·5 c.cm. adrenalin (1 : 1000) were given hypodermically, and 0·2 c.cm. adrenalin intravenously. Ten minutes later the condition was still the same in spite of the artificial respiration. Strychnia hypodermically was repeated. The condition became even worse, the cyanosis was severe, and the respirations fewer. Hot-water bottles were put to extremities and hot stupes to the heart (præcordia), but without benefit.

At that moment I thought that the patient would surely die in my hands, so I gave her 0·2 c.cm. adrenalin solution (1 : 1000) *intracardiac* in the fifth intercostal space. As I took out the needle I put the stethoscope over the heart region, and, to my great relief, I heard the heart sounds clearly; epigastric pulsations became evident, though the pulse could not be felt. After 20 minutes adrenalin (0·2 c.cm.) was again given intravenously. Respirations became more frequent, the cyanosis less marked, and corneæ became sensitive. The progress was, however, very slow. Then she was given 1 c.cm. ether intramuscularly, and caffein 0·25 g., ephedraline 1 c.cm., and rum 15 c.cm. hypodermically. At last she vomited a purely bilious vomit and came to herself, after one and a half hours, in which she had given me a really rough time. Four hours later she left the hospital.

Of course I did not venture to continue the tartar emetic treatment. The cause of the condition must have been a specially marked idiosyncrasy to tartar emetic, as I have not encountered such symptoms in about four years' practice in which I have given about 120,000 injections of this drug.

I am, Sir, yours faithfully,

A. FAKHRY,
P.M.O. Bilharzia and Ankylostoma Hospital, Kafr-El-Zayat, Egypt.

Nov. 1st, 1931.

ANÆSTHETISTS IN THE UNIT SYSTEM.

To the Editor of THE LANCET.

SIR,—I am glad to see that the question of payments to anæsthetists attached to surgical professorial units has been raised. Dr. Howard Jones has, if anything, understated the case. At most hospitals where this system obtains, the "Unit" operates in the mornings, so depriving the anæsthetist of his usual time for private work. In addition to this, the operations are frequently of a difficult and prolonged character, rendering substitutes in the form of house surgeons or resident anæsthetists undesirable. In most cases the surgeons of the unit have full-time hospital appointments, so that no recompense from additional private work can be expected. Why then is the anæsthetist the only unpaid member of the team?

It speaks well for the loyalty of anæsthetists to their hospitals that the present system has worked at all, but this is no reason why the exploitation should continue. It is of course quite possible that the whole professorial unit system will be abandoned, as has already been done in the case of one large hospital in London, but while it continues the anomaly of the unpaid anæsthetist should be rectified without further delay.

As it would obviously be undesirable to single out one particular hospital in this matter I ask leave to sign myself Yours faithfully,

"LETHE."

Nov. 30th, 1931.

PAY PATIENTS AT NEWCASTLE.—Since the pay-bed section of the Victoria Infirmary, Newcastle-on-Tyne, was opened six months ago the 86 beds have been constantly occupied.

OBITUARY

VINCENT DORMER HARRIS, M.D., F.R.C.P.Lond.

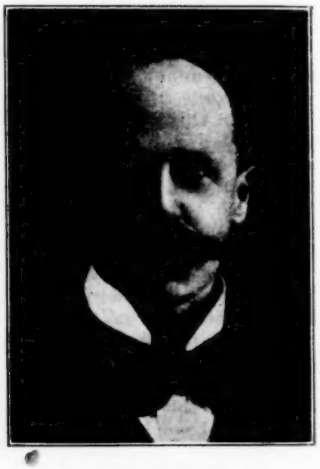
Dr. Vincent Harris, who died at Milford-on-Sea on Nov. 27th in his eighty-first year, had been living there for many years in retirement after a professional life of remarkable activity. Born in Bristol, and always retaining a touch of the west country speech and deliberation, Vincent Harris was educated at St. Bartholomew's Hospital, where he was intimate with a group which included Lauder Brunton, Norman Moore, Samuel West, D'Arcy Power, and Percy Kidd. He qualified in 1874, going on to take in rapid succession all the higher medical qualifications. For 14 years he remained attached to St. Bart.'s, first as ophthalmic house surgeon, then as house physician to Dr. James Andrew, later as demonstrator of physiology and casualty physician, only narrowly missing getting on the full staff on the medical side. His time was filled with coaching and writing, for he assisted Mr. Morrant Baker to edit several editions of Kirkes's Physiology, collaborated with D'Arcy Power in a manual for the physiological laboratory which was the standard work of its time, and examined for many years at the Conjoint examinations. In 1876 he was elected to the staff of the Metropolitan Hospital, in the following year to that of the West London Hospital, and in 1878 he began the association with the City of London Hospital for Diseases of the Chest, which lasted until his retirement in 1904. His active professional life was indeed largely bound up with his work at this hospital, to which he was greatly attached. His handbook, in collaboration with E. C. Beale, on the treatment of pulmonary consumption, contained the fruits of his experience there, but even so his interests were perhaps more concerned with the administrative than with the clinical side of hospital work. He excelled on committees, and to his wise counsel and unremitting labours the City of London Hospital owes much. The same is also true of his association with the National Hospital at Ventnor, which covered a period of 12 years.

DR. VINCENT HARRIS.

His retirement was partly owing to the hæmaturia from which he occasionally suffered and from which he eventually recovered. At Milford he became a justice of the peace and acted as a sort of local referee on all matters of municipal importance. He did not at once give up entirely his consulting work, for as a physician he was highly valued not only for his skill and judgment, but because of his thoroughness and painstaking. He was essentially an upright man, a loyal friend and colleague, a man of peace, even-tempered to a degree. Dr. Sainsbury, who gives us many personal details, adds "I cannot recall seeing him ruffled."

CHARLES ALBERT LEEDHAM-GREEN, M.D. Heidelb., Ch.M. Birm., F.R.C.S. Eng.

Mr. Leedham-Green, whose death took place on Nov. 29th at Padstow, Cornwall, was associated for the greater part of his professional life with the Birmingham School of Medicine. Son of the Rev. Richard Green, at one time Principal of Didsbury Wesleyan College, he was educated in London and received his early medical training in Birmingham. After graduating in 1891 he continued his studies in Germany, first at Göttingen, and later at Heidelberg, where he obtained the degree of M.D. in the same year as the F.R.C.S. Eng. Returning to Birmingham he was appointed surgeon to out-patients at the Queen's Hospital in 1897, and three years later he went to South Africa as a civil surgeon, but contracting typhoid fever soon after arrival he was invalided home. In 1906 he became full surgeon to the Queen's Hospital, a position which he held until 1921, when he retired on account of his health, and was appointed consulting surgeon. He held a similar position in other hospitals of the district, and for some years before his retirement he was joint professor of surgery in Birmingham University. At the outbreak of the Great War he was mobilised with the rank of major and placed on the staff of the First Southern General Hospital.



MR. LEEDHAM-GREEN.

From the outset Mr. Leedham-Green displayed qualities which ensured rapid advancement in his profession. He was fortunate in the moment at which he entered surgical practice, and in a very few years he became one of the leading surgeons in the Midlands, and had acquired a reputation which attracted to him patients from a very wide area. He had a commanding presence, complete confidence in himself, and the capacity to communicate that confidence to medical practitioners and their patients. He had an unusual mind, and many of his ideas were of a novel character and of great practical value. He studied thoroughly any branch of surgery in which he was interested, and made himself an expert in it. His skill as an operator was of the highest order, notably in disease of the thyroid and in genito-urinary surgery, and he was one of the pioneers in the use of the cystoscope and in ureteric catheterisation. He made extensive use of various types of regional and local anæsthesia. Amongst other

investigations was one on sterilisation of the hands, which was published in book form. The conclusion arrived at, that methylated spirit is a better disinfectant than any other antiseptic preparation that can be used in such a strength as will not damage the skin, led to the abandonment of the elaborate ritual that was then in vogue. He also contributed the article on gonorrhœa to Choyce's "System of Surgery," and in the medical journals gave numerous accounts of new technique and methods of treatment which bore witness to an inventive mind.

To his colleagues Mr. Leedham-Green was a constant stimulus. Having mastered in Germany the methods of aseptic surgery, and having developed there a talent for grasping the principles of his art, on his return he set about reforming whatever to his mind was erroneous in method, equipment, or management. His surgical enterprise and courage, always guided by unwearying care, quickly justified the optimism which gave hope and trust to his patients. Whilst he was quick in decision, and positive, even a little impetuous, in manner, he would in consultation patiently and quietly discuss the findings and give his reasons. But, one of his colleagues adds, he had no patience with slowness or indecision. To his juniors he was always ready to give a helping hand. He was a great reader of professional literature, and a tireless visitor to surgical congresses at home and abroad.

As a teacher he was not quite a success. The impress upon his mind made by his long stay on the Continent and his love of German literature and educational methods, made it difficult for the students to understand his lectures and line of thought. Those however who were privileged to act as his dressers and house surgeons, and to be in close personal contact with his work, were inspired and enthusiastic, and these posts were keenly sought after by the best students. His early retirement from the hospital and university, and shortly afterwards from active practice, caused wide regret both inside the medical school and outside it.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

MEDICINE IN INDIA.

IN the course of a debate on Indian Policy in the House of Commons on Dec. 2nd and 3rd, Dr. O'DONOVAN said that there were occasions when the sons of Hippocrates must raise their voices and tell politicians of all colours that no votes for political liberties were of the slightest value to dead or dying men. If there was one thing in which this country should take great pride it was the service which the medical profession had rendered to their Indian brothers. He said as a doctor that without distinction of race or colour, and without distinction of political outlook, the one great boon that England and Western civilisation had given to India had been the boon of life. One disease that almost every Anglo-Indian suffered from years after his return, a disease which swept through India generation after generation, carried by an insect so small that it could be destroyed between two fingers, was malaria. So potent was malaria that it reduced fertile plains back to the wild jungle, and reduced the strength of man to something subhuman, so that he could no longer contest for life with the forces of Nature. It was entirely due to white medicine and medicine taught in the schools of Europe that India saw a prospect of being freed from that great scourge. There was another appalling disease that rendered men unfit for work, or fit only to die in a ditch, or to live on the charity of their fellows. He referred to hookworm disease, which in some parts of India afflicted from 60 to 70 per cent. of the population. That disease had been the subject of study and investigation in the British and Continental schools of medicine, but to the study of that disease his Indian colleagues had practically contributed nothing. Hon. Members would also remember the dysenteries which laid men low. In the Royal Society of Medicine in its tropical section, and in the Tropical Hospital in Endsleigh-gardens, these diseases were studied and the benefit of that research was at the disposal of every Indian hospital. Were English medicine and the English connexion to be sharply cut, and were the only rights to be safeguarded the rights of political liberty, the only people who would suffer would be the Indians.

LEPROSY. CHOLERA. TUBERCULOSIS.

Might he call attention to the conditions of the lepers? They had heard of the untouchables, but there were tens of thousands of untouchables to whom no politician would give the touch of a helping hand; those of whom the old Psalmist said: "They have hands but cannot touch; they have feet but cannot walk; they have eyes but they cannot see." But these people had understanding. Leprosy could be controlled, and if modern medicine and medical research were allowed their full play leprosy could be abolished. The research upon leprosy was initiated in Western civilisation. It was one of the obligations which we owed to the Indians that nothing should be hastily done to amputate the beneficial connexion between Western medicine and Indian traditions. The ghastly disease of cholera was most prevalent in India. Indian medicine in its history was completely empty of any records of the study, investigation, and the cure of cholera. Because of that disease and the investigation of it many of his professional brethren had died, and many more doubtless would die, and die gladly, and it was sad that in the White Paper issued by the Government, and in the Round Table Conferences, the work of the medical profession should be almost unrecorded. (Cheers.) Another disease which was as prevalent in India as in Britain was tuberculosis. It was quite likely that its great prevalence in India was due to the system of enclosing their womenkind; the custom of centuries which led to stunted growth, early death, and death in childbirth. That custom would not be broken by politicians, and he feared it would not be broken by missionaries. It could only be broken by a great increase in medical education throughout the Indian Empire. One of the most extraordinary features of the situation was the keenness of Indian students to come to study in England; the mother and mistress of the teaching of medicine in these modern days. So numerous were the Indian medical students that the Deans of our medical schools were hard put to it to find places for them. That was proof that we had much to give to India, and there was a great duty upon politicians to do nothing by playing down to the politics of the healthy to prevent this help being freely offered. Although he had never been to India, the diseases of that country had been impressed upon his mind and upon the minds of his medical colleagues since their earliest professional days. Malaria was known in the days of Hippocrates, and among those who had studied it were Sir Ronald Ross and Sir Patrick Manson. So intimate was the knowledge which the London medical schools had of the medical needs of India that he felt that he might speak on the subject not as a stranger, but as one to whom these things were an everyday matter. Politics were mere phantoms unless they were

directed first to the health of the people, which was of far greater importance than either votes or status. (Cheers.)

SOCIAL SERVICES.

Miss RATHBONE said that in a large proportion of the Indian villages in which the great majority of the people of India lived the social services, except for some insufficient schools, were practically non-existent. Why was there discontent in India? Let them take any of the books which dealt with the life of the masses of the Indian people—not books written by politicians or tourists, but any of the recent blue-books, such as the Whitley Report on Labour, or the Joshi Report on Child Marriage. Let them try to visualise the kind of life which was indicated by the dry facts in those documents. To those who had the rare and uncomfortable faculty of being able to visualise life from figures it often seemed that a single line of vital statistics, an average or a percentage, contained more tragedy, more sob-stuff, more cause for tears than all the tragedies of Shakespeare and Æschylus. Let them take one or two crumbs at random from these Reports. For example, the fact that the average life of an Indian was 25 years, as against 54 for an Englishman, that they had a death-rate of 30 to 35 per 1000, and that in the area of Ahmedabad, occupied by the working classes, there was a terrible picture of squalor. The Whitley Report stated that nearly 90 per cent. of the houses were one-roomed; they were badly built, insanitary, ill-ventilated, and overcrowded. Even in the large towns few sick people, even those fatally ill, ever saw a doctor, and certificates of death were usually guesswork given by a non-medical registrar. When they imagined what life under these conditions meant could they wonder that the minds of the Indian peasants were like dry tinder on which one spark might raise a conflagration, and she suggested that in the abject poverty and ill-health might be found the root causes of India's discontent.

LEGISLATION ADVANCED.

In the House of Lords on Wednesday, Dec. 2nd, the Veterinary Surgeons (Irish Free State Agreement) Bill was introduced and read a first time. The National Health Insurance (Prolongation of Insurance) Bill was read a second time. On the following day the Indian Pay (Temporary Abatements) Bill was read a second time. The National Health Insurance (Prolongation of Insurance) Bill passed through Committee.

On Friday, Dec. 4th, the Orders dated Nov. 20th and 30th under the Abnormal Importations (Customs Duties) Act, 1931, were approved by the House of Commons.

HOUSE OF COMMONS.

THURSDAY, DEC. 3RD.

The Means Test and Transitional Benefit.

Captain FRASER asked the Minister of Labour if the Government would take the necessary steps to make it obligatory on public assistance committees when dealing with transitional benefit not to take into account disability pensions when assessing the incomes of ex-Service men.—Sir HENRY BETTERTON replied: I cannot issue any instructions which would conflict with the Order in Council. Under the Order, the public assistance authority must not make it a rule to disregard disability pensions, but in considering the needs of a pensioner they must have regard to his disability, and it is entirely within their discretion to make an increase of award, within the limits of the full rate of transitional payments, on the ground of that disability, and the increase of need that results from it.

Sir STAFFORD CRIPPS asked the Minister of Health whether he was aware that the Bristol public assistance committee had made a practice of taking into account benefits under the National Health Insurance and not disregarding the first 7*s.* 6*d.*, as required by Section 48 of the Poor-law Act, 1930, in assessing the needs of able-bodied applicants for out-door relief; and whether he would take immediate steps to see that this practice is discontinued.—Sir E. HILTON YOUNG replied: I am informed on inquiry that the Bristol Public Assistance Committee have no such practice. In one case they took into consideration 7*s.* 6*d.* National Health Insurance benefit payable to the wife of the applicant in assessing the amount of transitional payment for the applicant. I am advised that this procedure is correct, since the special provisions of Section 48 of the Poor-law Act, 1930, only apply to National Health Insurance benefits to which the applicant himself is entitled.

Lord EUSTACE PERCY asked the Minister of Health whether a public assistance authority in administering poor relief were bound to take into account a disability pension.—Sir E. HILTON YOUNG replied: The public assistance authority must not make it a rule to disregard disability pensions. But, in considering the needs of a pensioner, they must have regard to his disability, and it is entirely within their discretion to make an increase of award on the ground of that disability, and the increase of need that results from it.

Captain IAN FRASER asked the Minister of Health whether public assistance committees in assessing the means of an ex-Service man applying for relief were entitled, after taking into account a disability pension, to increase the relief given in consideration of the greater need due to the disability.—Sir E. HILTON YOUNG replied: Yes, Sir.

Treatment of Young Offenders.

Major NATHAN asked the Home Secretary whether he proposed to introduce a Bill to give legislative effect to the recommendations contained in the Report of the Departmental Committee on the Treatment of Young Offenders (Cmd. 2831) especially in relation to the abolition of imprisonment for young persons under 17 years of age, and the abolition of the sentence of death upon any person under the age of 18.—Sir H. Samuel replied: Yes, Sir. As I stated on Thursday last, the Government hope to be able to introduce a Bill dealing with this subject in the course of the present session.

Street Accidents and Conveyance to Hospital.

Mr. PIKE asked the Home Secretary whether he was aware that on Nov. 25th, at approximately 12.35 P.M., a small child was run down by a motor omnibus in Whitehall; that the constable on duty, after handing the child into the care of a pedestrian, left the scene of the accident, and that seven minutes elapsed before the child was placed in a car and taken to hospital; that this was entirely due to the initiative of a pedestrian; and would he assure the House that in any such future event the police would be empowered to claim the assistance of the first approaching car.—Sir HERBERT SAMUEL replied: I have made inquiry and find that the constable placed the child in the care of a bystander while he went to a telephone nearby to summon an ambulance. The police may, in proper cases, obtain the use of cabs or private motor-cars for the removal of injured persons to hospital, but it is not always possible to ascertain on the spot the full extent of the injuries which have been suffered; much harm may be done by removal in an unsuitable vehicle, and when an ambulance can be obtained quickly it is generally safer and better in every way to await the arrival of that vehicle. I do not think any fresh instructions are required.

Noises at Night in the City of London.

Captain ELLISTON asked the Home Secretary whether, in view of the annoyance caused by the prolonged ringing of burglar-alarm bells, started by traffic vibration or accidental contacts, especially during the night hours in the City of London, he would issue model by-laws, based on police requirements, for adoption by local authorities who wished to deal with this nuisance.—Sir HERBERT SAMUEL replied: My department has been for some time in consultation with the London County Council on the subject of a by-law to deal with this matter. The form of by-law has now been settled, subject to minor details of drafting, and I have intimated that if the London County Council decide to adopt it I am willing to approve it, in due course, subject to the consideration of any objections or representations which may be received, after statutory notice of the by-law has been given.

Housing and Slum Clearance.

Lord APSLEY asked the Minister of Health whether, in view of the large number of middle-class houses to let or for sale as a result of the economic depression, he would issue a circular to the local authorities as to the desirability of using such powers as they possessed for the purpose of reconditioning and adapting such dwellings for the occupation of several families.—Sir E. HILTON YOUNG replied: Local authorities have already under Section 57 of the Housing Act, 1925, powers of taking the action suggested, but I am not myself aware of any large increase in the number of vacant houses which are suitable for conversion.

and past experience does not suggest that conversion of this kind is generally economical or otherwise satisfactory.

Mr. COVE asked the Minister of Health the number of houses proposed to be demolished by the London County Council under its five years' programme, and the number which it now proposed to demolish.—Sir E HILTON YOUNG replied: The number is 3000. I have not been informed of any alteration.

Black-listed Elementary Schools.

Mr. GROVES asked the President of the Board of Education the number of elementary schools still on the black list, showing the various grades of such schools; and what steps he proposed to take to effect a change in such state of affairs.—Sir DONALD MACLEAN replied: There are still 1527 elementary schools on the "black list." Of these, 295 are in Division A of the list, 981 in Division B, and 251 in Division C. Circular 1413 shows that it is hoped that the Board will be able to approve for grant some expenditure for dealing with these schools.

Medical Regulations and Imported Food.

Brigadier-General CLIFTON BROWN asked the Minister of Health whether he was aware of the importation last week of milk churns containing foreign imported liquid milk; and what were the medical regulations under which this milk was allowed into this country.—Sir E. HILTON YOUNG replied: Yes, Sir. The regulations in question are the Public Health (Imported Milk) Regulations, and these provide for registration of consignees by the Port Sanitary Authority, and require that imported milk shall not contain more than 100,000 bacteria per cubic centimetre, and shall be free from tubercle bacilli. I may add that samples of the milk referred to by my hon. and gallant friend are being taken under the regulations.

Insured Persons and Medical Fees.

Dr. HILLMAN asked the Minister of Health if he was aware that the new regulation recently made under the National Health Insurance Acts merely regularised a practice which had been in existence for many years of permitting a doctor to charge a fee for treating an insured person if such person declared in writing that he did not desire treatment under the Insurance Acts, and that this new regulation was discussed so long ago as September, 1930, and whether its proposal originated from the Ministry of Health or from representatives of the medical profession.—Sir E. HILTON YOUNG replied: The position is stated with substantial accuracy in the first part of my hon. friend's question, subject to the qualifications that no new regulation has yet been actually made or even published in draft, and that the requirement of a written request is a new requirement which was designed as a further safeguard for the interests of insured persons. The answer to the second part of the question is that the provision referred to was proposed by the Ministry of Health itself for inclusion in a general redraft of certain parts of the Medical Benefit Regulations designed to make them clearer and easier to administer in regard to fee charging and other matters.

Dr. HILLMAN: Are there any grounds for the suggestion that the doctors will make large sums of money out of the new regulations, and so recoup themselves for the losses on the economy proposals?

Sir E. HILTON YOUNG: Certainly I have no information to that effect.

Dr. O'DONOVAN asked the Minister of Health whether he could give statistics to show to what extent the special conditions which provided that a panel practitioner might accept fees in respect of treatment given to an insured patient not on the practitioner's list were still being taken advantage of.—Sir E. HILTON YOUNG replied: I regret that I am not in possession of any statistics on the point raised in the question.

Dust and Fume Nuisance from Power Stations.

Mr. BOSSOM asked the Minister of Transport whether any decision had yet been taken as to the Government's intentions regarding the dust and fume nuisance from the power stations; and when it is expected to receive the report from the chimney emissions committee, which was set up to inquire into the matter.—Mr. PYBUS replied: With regard to the emission of sulphur fumes, I would refer my hon. friend to the second report of the committee presided over by the Government chemist which was laid before Parliament in November, 1930. The Electricity Commissioners inform me that good progress has been made by the committee to which he refers, but that they are not yet in a position to say when it will be able to present its report.

MONDAY, DEC. 7TH.

Valuation of Approved Societies.

Mr. RHYS DAVIES asked the Minister of Health when the actuary's report on the third valuation of approved societies might be expected.—Sir E. HILTON YOUNG replied: This report has been laid before Parliament and is being printed. Publication within a week or two may therefore be expected.

The Calmette Vaccine.

Sir FRANK SANDERSON asked the Minister of Agriculture whether he would take steps to see that the Calmette, or B C G, vaccine, concerning the bad effects of which upon experimental animals certain experts had given evidence at the inquiry into the death of 76 babies at Lübeck, should not be used upon farm animals in this country without his consent.—Sir J. GILMOUR replied: I am informed that vaccine cultures have been distributed by Prof. Calmette to responsible medical and veterinary authorities for experiment and trial. In this country three veterinary laboratories are supplying vaccine to veterinary surgeons for the treatment of calves born in certain selected infected herds, but no case has been brought to my notice in which the vaccine is alleged to have produced harmful effects. I understand that the vaccine is not being sold by commercial firms, and is not obtainable by the public. I do not propose to restrict the work of the laboratories engaged on farm trials of the vaccine.

TUESDAY, DEC. 8TH.

International Labour Convention.

Mr. MANDER asked the Secretary for Mines whether he could make any statement in regard to the ratification of the recent International Labour Convention on the hours of work in coal-mines.—Mr. ISAAC FOOT replied: Yes, Sir. At the request of H.M. Government, the International Labour Office is issuing invitations to the Governments of the six other countries chiefly interested—that is to say, Belgium, Czecho-Slovakia, France, Germany, Netherlands, and Poland—to attend a meeting at Geneva on Jan. 7th for the purpose of an informal discussion upon the question of ratification.

Conditions of Butter Production in Russia.

Sir WILLIAM DAVISON asked the Minister of Health whether his attention had been called to recent Russian official statements as to the insanitary conditions of many of the farms where milk was produced in Russia; and what steps were being taken to see that the large quantities of butter which were being imported into this country from Soviet Russia were manufactured under hygienic conditions such as are required from British and Dominion farmers.—Mr. E. BROWN (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is aware of statements in the press on this subject. Russian butter, with other foods, is subject to examination on arrival under the Imported Food Regulations and the Preservatives Regulations. My department has not investigated the conditions under which the butter is produced, but arrangements were made last summer for samples of the butter to be examined bacteriologically. The reports on these examinations were satisfactory, but my right hon. friend is considering the desirability of further similar examinations.

MEDICAL NEWS

Society of Apothecaries of London.

At recent examinations the following candidates were successful:—

MASTER OF MIDWIFERY.

J. T. Cameron, M.D. Aberd., Mary D. Rankine, M.B. Edin., and H. G. Topping, M.D. Aberd.

University of Dublin.

At recent examinations in the School of Physic, Trinity College, the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Medicine.—*A. A. Cunningham, J. A. Wallace, I. G. L. Ford, Joseph Miller, O. W. S. FitzGerald, Dorothy R. R. Solomons, Edward Morrison, H. J. Eustace, E. S. Samuels, J. A. Page, A. J. Harden, E. W. West, and H. St. G. Smith.

Surgery.—*A. A. Cunningham, H. F. G. Irwin, G. A. Wray, J. A. Wallace, I. G. L. Ford, J. B. Fleming, R. C. Sutton, O. W. S. FitzGerald, E. F. Burton, J. A. Page, E. W. West, A. D. Barber, H. J. Eustace, Joseph Miller, C. H. Hutchinson, Daniel Nolan, J. L. Martin, and R. D. Scott.

Midwifery.—*J. J. Russell, J. L. du Preez, C. J. Hassett, P. H. Stone, Sydney Brass, C. H. M'Mahon, P. P. Murphy, C. J. Mullen, C. de V. Shortt, Edith M. P. Broderick, Martin Fallon, Robert M'Neilly, P. G. Daly, Ray G. Barron, W. J. Craig, A. L. Pennefather, J. W. Craig, G. C. V. O'Driscoll, and Alfred Pollitt.

* Passed on high marks.

University of Bristol.

At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—S. B. Adams, A. J. Board, Violet Fry, Winifred M. Hill, Aldyth D. Jones, Gwladys R. Llewelyn, H. E. Pearse, Frances E. Powell, and Mary G. Thomas.

Part II.—F. W. A. Fosbery, J. A. Kersley, A. J. B. Miall, and S. C. Wake. In Group I. (Completing Examination): O. J. P. Bollon. In Group I. only: A. C. Price.

FINAL PROFESSIONAL EXAMINATION FOR L.D.S.

Nathanial Miller and H. L. Saunders.

University of Birmingham.

The annual dinner of the Birmingham Medical School will be held at the Grand Hotel, Birmingham, on Jan. 28th, 1932, at 8.15 P.M. A presentation will be made to Prof. Leonard Gamgee on his retirement from the chair of surgery.

University of Durham.

Sir Robert Bolam, F.R.C.P., has been appointed a pro-vice-chancellor of the University.

Royal College of Physicians of Edinburgh.

At the annual meeting of the College, held on Dec. 3rd, Dr. Robert Thin was elected President. The following were elected to form the Council for the ensuing year:—Sir Norman Walker, Dr. R. A. Fleming, Dr. Wm. Fordyce, Dr. Edwin Bramwell, Dr. Edwin Matthew, and Dr. A. Fergus Hewat. Sir Norman Walker was nominated vice-president. At an extraordinary meeting held after the College meeting, Dr. G. Lovell Gulland and Dr. Fordyce were elected representatives of the College on the board of management of the Royal Infirmary for the ensuing year. Mr. J. W. Dowden, President of the Royal College of Surgeons of Edinburgh, was elected an honorary Fellow of the College.

National Council of Nurses of Great Britain.

Mrs. Bedford Fenwick, the president, took the chair at the annual meeting of the Council, held on Nov. 25th at the rooms of the Medical Society of London. Miss M. S. Cochrane, R.R.C. (Charing Cross Hospital), was elected vice-president; and Miss R. E. Darbyshire, R.R.C. (University College Hospital), and Miss E. T. Bickerton, R.R.C. (Prince of Wales' General Hospital, Tottenham), were elected directors.

British Institute of Radiology.

The annual dinner of the British Institute of Radiology incorporated with the Rontgen Society was held on Dec. 4th at the Trocadero Restaurant, London, the President of the Institute, Dr. A. E. Barclay, being in the chair. In proposing the toast of the Institute, Mr. W. E. Schall spoke of the valuable liaison it provided between the technical manufacturer and the working radiologist. For any qualification or diploma in radiology, he said, close study was to-day needed if the work in X ray departments was to be of a satisfactory nature. He thought that there should be radiological societies and that the meetings at them should be confidential, for discussions in this manner would be rendered more valuable, while a central journal could be employed to inform other countries of the work that was going on. Dr. Barclay, in reply, pointed out that a great vista of utility was opening up before the Institute, so that coöperative work would make it truly representative of British radiology. He read a telegram from the American Roentgen Society congratulating the Institute on its progress, and at the close of his speech presented the Mackenzie Davidson medal to Prof. Hans Holfelder of Frankfurt. The toast of the Guests was submitted by Dr. Stanley Melville, who adjudged the merits of the various visitors, and sentenced them to different penalties in accordance with the qualities attributed to them. The toast was replied to by Sir Walter Fletcher, who said that the development of the Institute, as representing the new science of radiology, had deeply interested the Medical Research Council ever since the formation of that body. He testified to the necessity of such an Institute by describing the rapidity with which knowledge had grown in connexion with the science. A tumultuous cataract of new wisdom had arrived, he said, presenting many complex forms, and the Institute was discharging work of the highest value in promoting the growth of radiology and organising the resulting knowledge as a craft and a science. Sir Thomas Purves, chief of the Post Office Engineering Department, and Prof. G. E. Gask also replied.

Among the guests present were Sir Thomas Horder, Mr. G. Shearer, D.Sc., Mr. G. L. Winch, Mr. Herbert Tilley, Prof. Lloyd Hopwood, Dr. W. M. Levitt, Prof. Woodburn Morison, and Mr. W. V. Mayneord. The speeches were interspersed pleasantly with the rendering of old English songs by Miss Phyllis Scott and Mr. Rorke.

Royal Faculty of Physicians and Surgeons of Glasgow.

At a meeting of the Faculty on Dec. 7th, the following were admitted to the Fellowship: David Riddell Campbell, Malcolm Carfrae Douglas, John Shaw Dunn, Gilbert Garrey, James Livingstone Loudon, Alexander Miller, Ellen Brown Orr, and Albert Arthur Fitzgerald Peel.

Royal College of Physicians and Surgeons of Canada.

The second annual meeting of the College was held at Ottawa on Nov. 19th, with Dr. J. C. Meakins, the President, in the chair. About 160 Fellows attended, and with their wives were entertained in the evening by the Governor-General and Lady Bessborough. The newly elected President is Dr. F. N. G. Starr, of Toronto. Dr. W. T. Connell, of Kingston, becomes vice-president in the section of medicine, and Dr. P. C. Dagneau, of Quebec, vice-president in the section of surgery. Dr. T. C. Routley, of Toronto, remains registrar-secretary.

College of Physicians of Philadelphia.

Alvarenga Prize.—The next award of this prize, amounting to about 300 dollars, will be made on July 14th, 1932. Essays on any subject in medicine will be considered, provided they have not appeared in print in any form, and have not been presented elsewhere in competition for a prize. They must be in prescribed form, and must be received by the secretary of the College by May 1st.

The Alvarenga prize for 1931 has been awarded to Dr. Edgar S. J. King, Melbourne, Australia, for an essay on the Nature of the Stroma of the Ovary.

International Congress of Tropical Medicine.

Owing to the present economic crisis the Dutch Government feels itself unable to maintain its promise of financial aid for the second International Congress of Tropical Medicine, which was to have been held in Holland from Sept. 12th to 17th, 1932. The Congress has accordingly been postponed until the situation improves.

Week-end Courses on Disorders of Childhood.

As already announced, a post-graduate course on Common Disorders of Childhood and their Treatment will be given at the Hospital for Sick Children, Great Ormond-street, London, W.C., on Saturday, Dec. 12th (9 A.M. to 4 P.M.), and Sunday, the 13th (10 A.M. to noon). It is intended primarily for those in general practice, and there will be no fee for attendance.

Extension of Derbyshire Children's Hospital.

The Duchess of Rutland recently opened enlargements of this hospital comprising two new medical wards and a nurses' home which have cost £20,000.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Dec. 14th.—5 P.M., UNITED SERVICES. Paper: Surg.-Lt. Comdr. A. E. Phillips: Recent Research Work in Deep Sea Diving. At 8.30 P.M., Reception in the Library by the President and Mrs. Watts Eden. At 9.15 P.M., a film "The Roof of the World" will be shown.

TUESDAY.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Discussion: The Comparative Pathology of Tumours. Openers: Dr. W. Cramer, Dr. S. L. Baker, Dr. A. L. Sheather, and Mr. J. R. M. Innes.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Dr. A. M. H. Gray: 1. Scleroderma in a Tuberculous Patient. Dr. F. Parkes Weber: 2. Urticaria Pigmentosa in an Adult. 3. Cutis Verticis Gyrata. Dr. W. N. Goldsmith: 4. Lejomyoma. Dr. W. Knowsley Sibley: 5. Seborrhœic Warts and Superficial Rodent Ulcers.

FRIDAY.—5.30 P.M., PHYSICAL MEDICINE. Prof. A. V. Hill: The Liberation of Energy by Muscle. (Samuel Hyde Memorial Lecture.)

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Dec. 14th.—8.30 P.M., Discussion on X Rays in the Diagnosis of Thoracic Disease, to be introduced by Dr. P. J. Kerley, Dr. F. G. Chandler, and Mr. J. E. H. Roberts.

HUNTERIAN SOCIETY.
THURSDAY, Dec. 17th.—7.15 P.M., Dinner Meeting at Simpson's Restaurant, Bird-in-Hand-court, Cheapside, E.C. Discussion on Oral Sepsis (Openers: Prof. John Eyre, Dr. W. S. C. Copeman, and Mr. C. R. Rudolf).

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.
FRIDAY, Dec. 18th.—5 P.M., Discussion on the Mental Treatment Act, 1930. (Openers: Sir Hubert Bond and Dr. P. K. McCowan.)

CHELSEA CLINICAL SOCIETY, Hotel Rembrandt, Thurloe-place, S.W.
TUESDAY, Dec. 15th.—8.30 P.M. (preceded by dinner at 7.30 P.M.), Mr. A. Lawrence Abel: The Cinema in relation to Modern Medicine and Surgery.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Dec. 14th, to SATURDAY, Dec. 19th.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Tues., Post-graduate demonstration by Dr. Bernard Myers on Pulmonary Affections of Childhood, at 2 P.M.—MILLER GENERAL HOSPITAL, Greenwich-road, S.E. Thurs., Post-graduate demonstration by Mr. Reginald Ledlie on Varicose Vein Injections, at 11 A.M.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Dec. 14th.—10 A.M., Gynæcological Wards; Genito-urinary Operations; Skin Department. 11 A.M., Surgical Wards. 2 P.M., Surgical Wards: Medical, Surgical, Eye, and Gynæcological Out-patients.
TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Demonstration; Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations; Medical, Surgical, and Throat Out-patients.
WEDNESDAY.—10 A.M., Medical Wards; Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 2.30 P.M., Gynæcological Operations. 4.45 P.M., Venereal Diseases Demonstration.
THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical Surgical, Eye, and Genito-urinary Out-patients. 2.30 P.M., Operations.
FRIDAY.—10 A.M., Medical Wards, Skin Department, Dental Department. 2 P.M., Medical, Surgical, and Throat Out-patients. 2.30 P.M., Operations.
SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Wards. Surgical Out-patients: Children's Medical Out-patients.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Dec. 17th.—9 P.M., Mr. Yates Bell: Recent Advances in Urology.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Dec. 15th.—5 P.M., Dr. S. E. Dore: Erythemato-Squamous Eruptions.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Dec. 17th.—4.30 P.M., Mr. E. T. C. Milligan: Procto-Colitis.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, London, W.C.
MONDAY, Dec. 14th.—4.15 P.M., Dr. J. S. Prendergast: History of Typhoid Fever.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Dec. 15th.—3.15 P.M., Mr. Hamilton Bailey: The Breast.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Dec. 16th.—9 P.M., Mr. Leonard Phillips: A Tour in Russia. (Cinematograph lecture.)

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Dec. 16th.—4 P.M., Mr. T. W. Letchworth: Toxic Amblyopia and Retrobulbar Neuritis.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Dec. 16th.—4.30 P.M., Dr. Jenner Hoskin: Medical Complications of Prostatectomy.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Dec. 18th.—4 P.M., Mr. Lowndes Yates: Complications of Catarrhal Inflammation of the Nose.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Dec. 16th.—4 P.M., Sir Pendrill Varrier-Jones: Welfare of the Tuberculous Citizen. (Lantern illustrations.)

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Dec. 15th.—4.15 P.M., Dr. T. H. Oliver: Diet.

ROYAL INFIRMARY, Glasgow.
WEDNESDAY, Dec. 16th.—4.15 P.M., Mr. D. Duff: Surgical Cases.

FACULTY HALL, St. Vincent-street, Glasgow.
TUESDAY, Dec. 15th.—4 P.M., Prof. A. Young: Open Operative Treatment of Certain Common Fractures.

Vacancies

For further information refer to the advertisement columns.

Birkenhead County Borough.—Res. Asst. M.O. £350.
Birmingham, Dudley-road Hospital.—Gynæcologist and Obstetrician. £750.
Birmingham, Midland Hospital, Easy-row.—H.S. £150.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £100.
Brighton, Royal Sussex County Hospital.—H.S. £150. Also Cas. H.S. £120.
Bristol General Hospital.—Two H.P.'s. Two H.S.'s. Res. Obstet. O. H.S. to Spec. Depts. Each at rate of £80. Also Cas. H.S. At rate of £100.
Bucks C. C.—Asst. County M.O. and M.O.H. £800.
Burnley, Victoria Hospital.—Two H.S.'s. Each at rate of £150.
Calcutta Medical College.—Prof. of Pathology, &c. Rs.800 a month.
Cambridge.—George Henry Lewis Studentship. £250.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Clin. Assts.
Dreadnought Hospital, Greenwich.—Physician.
East London Hospital for Children, Shadwell, E.—Res. Med. Reg. £150.
Edinburgh Royal College of Physicians.—Kirk Duncanson Fellowship for Medical Research. £150.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Surg.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res H.P. At rate of £100. Also Surg. to Ear, Nose, and Throat Dept.
Hull, Beverley-road Institution.—Asst. M.O. £300.
Hull Royal Infirmary.—Third H.S. At rate of £150.
Indian Medical Service.—European Officers.
Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.
Khartoum, Wellcome Tropical Research Laboratories.—Bacteriologist. £E.660.
London Lock Hospital, 91, Dean-street, Oxford-street, W.—H.S. At rate of £200.
London University.—Geoffrey Duveen Travelling Studentship in Oto-Rhino-Laryngology. £450.
Manchester, Ancoats Hospital.—Med. Reg.
Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. £120.
Manchester Royal Infirmary.—M.O. for Genito-Urinary Section. Also Three Asst. M.O.'s.
Manchester, St. Mary's Hospital.—H.S. for Whitworth Park Branch. At rate of £50.
Maudsley Hospital, Denmark-hill, S.E.—Second Asst. M.O. Also Asst. M.O. £625 and £475 respectively.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150.
North-Eastern Fever Hospital, St. Anne's-road, Tottenham, N.—Asst. M.O. £350.
North-Western Fever Hospital, Lawn-road, Hampstead, N.W.—H.P. £80.
Peckham House, 112, Peckham-road, S.E.—Jun. Asst. M.O. £300.
Poplar Hospital for Accidents, East India-road, Poplar, E.—Second Res. O. £175.
Radium Institute, Riding House-street, W.—H.S. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150.
Rotherham, Oakwood Hall Sanatorium.—Asst. M.O. £300.
Royal Army Medical Corps.—25 Commissions.
Royal Free Hospital, Gray's Inn-road, W.C.—Clin. Assistantships in Spec. Depts.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.
St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. Clin. Assts.
St. Mary's Hospital, W.—Med. Supt. £400.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Hon. Asst. Surg. Also Clin. Assts.
Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.
Salisbury General Infirmary.—Two H.S.'s. Each £150.
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.
Sheffield Royal Infirmary.—Ophth. H.S., Asst. Aural and Ophth. H.S., and Asst. Cas. O. Each at rate of £80.
Southampton, Royal South Hants and Southampton Hospital.—Two H.S.'s and Cas. O. Each at rate of £150.
South London Hospital for Women, Clapham Common, S.W.—Clin. Assts.
Southport General Infirmary.—Sen. H.S. £200.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Orthopædic Surg. £500.
Woolwich and District War Memorial Hospital, Shooters hill, S.E.—H.P. and H.S. Each at rate of £100.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Grays (Essex) and Blackpool (Lancs).

The Home Secretary is considering the appointment of an ophthalmic specialist to be a Medical Referee under the Workmen's Compensation Act for cases arising in the district of the County Courts in Circuits No. 59 and 57, Cornwall and South Devon. Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W., not later than Dec. 31st.

NOTES, COMMENTS, AND ABSTRACTS

SURGERY OF THE URINARY ORGANS.

SIXTY YEARS OF RETROSPECT.*

BY G. BUCKSTON BROWNE, F.R.C.S. ENG.,

A TRUSTEE OF THE HUNTERIAN COLLECTION; HONORARY GOLD MEDALLIST OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

LITHOTRITY.

WHEN, in 1874, Sir Henry Thompson invited me to assist him in his private practice all small bladder stones were crushed and sometimes washed out. Large stones, say up to an ounce and a half, were crushed and removed in several sittings, and very large stones were removed by perineal lithotomy. Mr. Joseph Clover had published an account of his rubber evacuator and tubes for use after lithotrity in THE LANCET (1866, i., 515), but he was not an operator himself—only, as an anæsthetist, a witness of stone operations—and his apparatus had not made much headway. When I began to operate for stone in 1875 I employed Clover as anæsthetist, and carried his evacuator to all operations. Lithotrity was born in pre-anæsthetic days, and the many-sitting operations were practised because conscious patients can bear only a few minutes' pain, and the process of pumping fluid in and out of the bladder is well nigh intolerable. Such was the position up to the autumn of 1878, when Prof. Bigelow, of Boston, published his great inspiration, "Why not crush and wash out all crushable stones at one operation?" He modified—he did not invent—lithotrites, tubes, and evacuator. Some of his modifications are now abandoned, but Bigelow is undoubtedly the father of the modern operation of litholapaxy, or crushing and washing out the stone at one operation or sitting; while the operation would never have been possible had it not been for the invention by Clover of his rubber evacuating bottle.

At this time—i.e., all through the 'seventies—large stones were removed by perineal, generally lateral, lithotomy. We followed the traditions of Cheselden. The high or suprapubic road into the bladder had been abandoned by that great surgeon. It is obvious that a careful suprapubic dissection on a struggling unanæsthetised patient—perfectly unable to bear a distended bladder—must have been highly dangerous, even wellnigh impossible. The peritoneum must often have been fatally injured, and no wonder the low or perineal route was chosen by Cheselden. The operation was often over in a minute or so, but accidents were not unknown—perforated bladder, wounded rectum, and frequently profuse hæmorrhage. No surgeon undertook his first lateral lithotomy without anxiety, or even trepidation.

SUPRAPUBIC CYSTOTOMY.

The year 1880 was the annus mirabilis of my surgical life, not by reason of any great discovery, but by a sound and scientific return to an old surgical method—suprapubic cystotomy. Under the influence of Cheselden and his followers, suprapubic cystotomy had fallen into complete disrepute. It was never heard of. In 1878, however, it occurred to Dr. John George Garson, an assistant in the Hunterian Museum of the Royal College of Surgeons of England, to distend the rectum and to make frozen sections of the parts above the pubes. He read his memoir before the German Surgical Congress in Berlin in April, 1878. Garson was not an operating surgeon, but there was present at the Congress a keen and enterprising surgeon, Dr. Petersen, of Kiel. He at once saw the importance of Garson's work, and invented the rubber rectal bag, known by his name, for distending the rectum and pushing up the bladder above the pubes before making a suprapubic cystotomy. Petersen's bag opened up an entirely new field of urinary bladder surgery; now, for the first time, could vesical tumour be accurately discovered and removed; encysted calculi, hitherto entirely irremovable, could be easily discovered and lifted out of their containing sacs; the post-prostatic pouch fully explored; and the encysted prostate attacked. Sir Henry Thompson, the first to remove a vesical tumour, realised at once the enormous advantages the suprapubic route possessed over the perineal, and I was soon able to publish two cases in my own practice of successful removal of encysted calculi, cases which up to that time had been quite incurable. In 1891 I read before the Medical Society of London a paper on the post-prostate pouch, where stones easily escaped detection by the sound of one surgeon, while being found shortly after by another, and often leading to bitterness, reproach, and even to legal action. All the surgical difficulties and mysteries of the urinary bladder were cleared up by the revival of the high operation. For many years I carried Petersen's bag to my operations, but in time gave it up as unnecessary, clumsy, and disagreeable.

PROSTATECTOMY.

Many surgeons had tried, in cases where the prostatic urethra was obstructed, to remove the obstruction by operation. The galvanic cautery had actually been tried, but all had been in vain. In lateral perineal lithotomy large masses of enlarged prostate had inadvertently been removed, but anæsthetics, antiseptics, and the suprapubic road into the bladder led Mr. Arthur Fergusson McGill (1846–1890) of Leeds, to think of attacking the enlarged prostate, with finger, scissors, and forceps, from above. He did so with great success, and in 1889 published his results. I was the first to follow his example in London, and on March 6th, 1893, before the Medical Society of London, with Sir Jonathan Hutchinson in the chair, I read two successful cases and showed one of prostatectomy. I said then, and have maintained ever since, that in certain cases it is a justifiable operation and sometimes perfectly successful, but that it is far too dangerous to be made an everyday routine operation. Just because a man has an enlarged prostate is not sufficient reason to subject him to the very grave risks of operation. We know that the prostate may be large without causing any difficulty in micturition, and it must never be forgotten that an enlarged prostate may atrophy. I have seen a catheter necessary for twelve months, and then micturition completely re-established naturally.

And now, in conclusion, I feel compelled to walk upon very delicate ground. I am well aware that we possess surgeons (I should like to mention names, but it would be unfair, perhaps invidious) who have brought the art of prostatectomy to great perfection, and have had corresponding successes. I would speak with the humility and gentleness befitting an old man. We have had 40 years of prostatectomy, and I have lost a large number of friends and acquaintances who I am convinced would have prolonged their lives indefinitely had they been content to lead the catheter life which in the 'seventies and 'eighties had been brought to great perfection. The object of the prostatectomy is to restore the function of complete and natural micturition, and this happy result is frequently brought about, but by no means always attained. Mere recovery from the operation is not sufficient, for the recovery may be a very qualified one. In the first place the operation is dangerous. It involves a large dissection of a part of the body highly sensitive, and with which the rest of the body is nervously intimately connected. The patient himself has reached a time of life when

* Abstract of a paper read before the Historical Section of the Royal Society of Medicine on Dec. 2nd, 1931.

the vital powers of healing are on the decline. Large veins are concerned, and frequently the urinary secretion is far from being an ideal lotion for a large wound. Patients often die immediately from hæmorrhage and from shock.

UNDESIRED SEQUELS.

If these be avoided or recovered from, all is not yet plain sailing.

1. Natural micturition may not return.
2. Very troublesome urethral obstruction or stricture may result.
3. Painful phosphatic deposits may occur at the neck of the bladder.
4. The shock of the operation may be so severe that the patient may never again be the man he was, and often dies within a short period.
5. And, finally, troublesome suprapubic fistula and even vesico-rectal fistula are not unknown.

In the days before prostatectomy, a prostatic patient, or any other patient who from atony or paralysis failed to empty his bladder, had to learn to pass a catheter. Before the introduction of the soft catheter this was indeed a sad affliction, and when the use of a metal catheter by the patient himself was difficult, I have known the patient obliged to reside close to his doctor's house. During my life time the soft catheter has been brought by manufacturers, under the guidance of surgeons, to great excellence, and I myself have had something to do with perfecting a simple aseptic apparatus which enables a patient to be as active as he likes and yet have a pure catheter always at hand.

I have known busy surgeons, physicians (two with Royal appointments), busy practitioners, judges, explorers, sportsmen, sailors, and ministers of religion, who have led active, happy, vigorous lives while entirely dependent upon the catheter. I once had three judges on the bench, all pupils of mine, and indeed I remember one saying to me, "I much prefer this method to the natural one; before, I was disturbed every 20 minutes, now I am good for six or eight hours." At the present moment I have several friends busy and happy, one of great age, and one a distinguished golfer, quite resigned and content with the catheter life.

The cases where prostatectomy is a necessity are those rare ones where the middle lobe is very large, projecting into the bladder and causing intense irritation, and where catheterism is exceptionally difficult, or the patient unusually clumsy, blind or partially blind, or possessing only one hand.

"DUPLEX THERAPY."

IN an address delivered before the Royal Society of Arts on Nov. 25th, Mr. G. G. Blake, M.I.E.E., described a form of treatment by diathermic and galvanic currents in combination, both currents being passed through the body at the same time by way of the same two electrodes. From this "duplex" treatment he claimed successful results in cases of gout, fibrositis, sprain, and even early arthritis, although in regard to the last-named he admitted it was not fair to speak of cure. Symptoms however had been eradicated, with relief of pain for long periods; a number of patients not requiring further treatment after an interval of nearly two years. Hundreds of similar cases treated by diathermy or ionisation, separately applied, before he hit upon the duplex treatment, had, he said, given results fairly good but not comparable with those obtained by the new method, either for speed, relief of pain, or lasting results. All the patients had been referred to him for treatment by various medical men. The electro-medical practitioner, who would like to know more exactly the types of arthritis that were submitted to the duplex treatment, will admit that the results as stated are remarkable. It remains however to explain how any treatment applied to the joints could produce such results in arthritis due to infection from a distant focus or to endocrine disturbance. The true value of any therapeutic agent must nevertheless be determined by its effects.

In the course of his demonstration, Mr. Blake showed that the diathermic current (which is alternating) is rectified when the electrodes are asymmetrical or do not make good contact. He has devised an instrument (which he calls a contactometer) to indicate on the galvanometer the amount of unidirectional current that flows when the rectification occurs. He pointed out the importance of good contact with the active electrode when the eye, for instance, is subjected to diathermy, and he believes that this contactometer would afford protection against burns during diathermic application to rectum, urethra, cervix, or other internal organ. It seems more likely however that damage would already be done when the contactometer gave evidence of it, and in any case correct application of electrodes should preclude damage. Mr. Blake also made some interesting remarks on the psycho-galvanic reflex which, when absent in cold-blooded subjects, may often be brought back by friction, radiant heat, or diathermy. His skilful and ingenious experiments illustrate the need for the physicist interested in biology in the investigation of the problems that confront the practitioner of physical medicine.

INQUIRIES.

I.

A boy of 15 and a girl of 16, living in a doctor's household in London, have not had measles, and are likely to be exposed to infection from attendance in one case at evening (L.C.C.) classes, in the other by visits as pupil teacher to elementary schools. Should they be partially immunised by convalescent serum over the peak period of risk of infection this winter?

The immunity conferred by convalescent serum is a passive one, and lasts for not longer than four weeks, possibly less. By giving a single dose of convalescent serum when the measles epidemic would be approaching its maximum, a person exposed to risk of infection could be protected during the period when the risk was greatest, and thus his chance of contracting measles during the course of the epidemic appreciably lessened. The period of protection could, of course, be prolonged by giving more than one injection of serum, spacing the doses at intervals of about three weeks, and since the serum is homologous there would be no risk of anaphylaxis. Whether or not it would be worth while minimising the risk of contracting measles in this instance by giving one or more doses of convalescent serum would depend largely on individual considerations. If, for reasons of health or on economic grounds, it was highly desirable that these two people should not contract measles, then it might be worth while giving them serum.

II.

A resident teacher in a Yorkshire nursery school, where there have been cases of diphtheria, is returning shortly to spend her holidays with her family in a south country county borough where there is scarcely any diphtheria prevalent. Should she submit herself to Schick test or faucial examination?

It would certainly be a good thing for this woman to submit herself to both Schick test and examination of the nasopharynx for diphtheria bacilli before returning to her family. Should the Schick test be negative, and the cultural reaction also negative, she would have the satisfaction of knowing that she was not liable either to infect others or to contract the disease herself. If the Schick reaction were negative and virulent diphtheria bacilli were present in the nasopharynx, then she should neither return to her family nor continue with her occupation until she ceased to be a carrier. On the other hand, a positive Schick test with a negative culture would also enable her to return to her family with a free conscience; but if she were likely to be exposed to infection on her return to work she would be well advised to be actively immunised, say with anatoxin, before doing so.

THE MEDICAL DIRECTORY FOR 1932.

THE eighty-eighth annual issue contains, as we noted last week, 445 more names than the previous issue, but of the seven sections into which the list of names is divided only four show an increase—viz., London + 41, Provinces + 301, Ireland + 3, Abroad + 143, while the other three show a decrease; Wales − 14, Scotland − 19, Services − 10. Otherwise the essential contents of the Directory are unaltered. In several places the type has been slightly rearranged with a certain economy of space, but it is difficult to improve on 87 years' experience. The medical report on British spas and seaside reports is particularly timely having regard to the embargo on foreign travel, and even in these hard times every practitioner who keeps up to date in his professional relations can scarcely afford to be without a copy of the work. The Directory is published by Messrs. J. and A. Churchill, at 40, Gloucester-place, London, W.1, and the price remains 36s.

THE ARNOLD TRIPLE FLOW SUPRAPUBIC URINAL.

THE appliance here illustrated consists of a kidney-shaped celluloid cap containing three outlets so arranged that no matter in what position the patient may be reposing, complete drainage may be effected. Provision is made not only for drainage by catheter, but also for the removal of any urine which may pass between the catheter and the abdominal walls. All three outlets are connected with a rubber bag fitted with a non-return valve which obviates any back flow. A special disc fitting holds the catheter in any desired position. The advantages claimed for the appliance are that the urine is immediately passed into the rubber bag; the patient may lie in various positions without fear of urine collecting; various sizes of catheter may be used; all parts can be removed and sterilised. An easily detached adjustable belt is fitted.

Suprapubic bag.

Messrs. John Bell and Croyden, in association with Messrs. Arnold and Sons and Savory and Moore, Ltd., 52, Wigmore-street, W., are the makers.

MORE ABOUT DOCTORS' WIVES.

WHEN summoned urgently to a patient who had had triplets, Dr. Plexus simply waved his hand and said, "Nature must be allowed to take her own course," and went on talking to Mrs. Murgatroyd. Rightly fearing the worst, his wife took a correspondence course in medicine and surgery, and when the crisis came was able to avert the dreadful Scandal of an Inquest by operating on the Lord of the Manor for appendicitis. "Except for trying to put on her gown back to front she hardly made any mistakes," and the patient "made an uninterrupted recovery and was as well as he had ever been except for some adhesions."

Readers of "Mrs. Dose, the Doctor's Wife," will recognise that here [1] we have another of Miss Joyce Dennys's diverting tales of medical practice. But even this opening story shows that in search of situations she has got much further away from every-day life. The new book is the fruit of imagination more than of observation, and to this extent it is a disappointing sequel.

None the less we meet many pleasant characters. Mrs. Heinstein, for instance, had enjoyed excellent health all her life, and liked to think of her inside as a round zinc tank, sometimes empty and sometimes full, but not complicated in any way, and of no conversational interest to herself or others. Mrs. Spatula circulated an advertisement for her husband, defied the General Medical Council, and organised a rebellion of doctors' wives. And poor Dr. Browne was "quite reasonably clever, though, of course, he was only a General Practitioner."

Among these and others the most touching figure perhaps is the Bad Wife who did wish she were a Better Wife for a Doctor. She was fond of gardening and reading books, and although she had a kind heart, was rather vague and dreamy. She sometimes forgot to smile at people in the street, "which is a very serious thing for a doctor's wife to do," but we are grateful to Miss Dennys for giving her story such a happy ending.

The illustrations are as good as before.

WANTED, TUBERCLE BACILLI.

Dr. W. M. Cumming, medical superintendent of Bradford City Sanatorium, Grassington, Yorkshire, writes as follows:—

"I am engaged in investigating the bacteriology of the tubercle bacilli to be isolated from the sputum in cases of pulmonary tuberculosis in which there is a definite history or other clinical evidence of a *previous* glandular infection. Such cases are not common, and I venture to beg the courtesy of your correspondence columns in order that I may ask if any tuberculosis officers, sanatorium superintendents, or others who have such cases under their care would be good enough to let me have specimens of sputum. It is not essential that tubercle bacilli be demonstrable microscopically, so long as the lung lesion is tuberculous. If anyone will send me a postcard I shall be very glad to send suitable container and cover."

Appointments

WALKENSHAW, T. R. D., L.D.S. Edin., has been appointed Hon. Consulting Surgeon to the Newcastle Dental Hospital.

WILSON, J. G., M.D., B.S. Lond., D.P.H., Medical Officer of Health for Dewsbury.

YULE, J., M.B., Ch.B. Glasg., D.P.H., M.O.H., County Borough of West Bromwich.

Workmen's Compensation Act: DOW, J. F., Ch.B. Manch., Medical Referee for Barrow-in-Furness, &c., County Courts, Circuit No. 3; and WILSON, A. G., M.B. Lond., for Doncaster, &c., Circuit No. 18.

Births, Marriages, and Deaths

BIRTHS.

BLOOM.—On Dec. 7th, 1931, at Cranford, Gerrards Cross, to Barbara (*née* Owen), wife of G. F. Harrison Bloom, of 17, Welbeck-street, W. 1—a daughter.

DEATHS.

LEEDHAM-GREEN.—On Nov. 29th, at Trevone, Cornwall, Charles Leedham-Green, Ch.M., F.R.C.S., of Belsize Park-gardens, N.W., late Professor of Surgery, Birmingham University.

OLIVEY.—On Dec. 3rd, J. M. A. Olivey, M.R.C.S., L.R.C.P., of Pentrelew, Hamworthy, and of High-street, Poole, Dorset.

WOOD.—At St. James Hospital, Balham, on Nov. 28th, 1931, Jane Edith Wood, M.B., B.S. Lond., M.R.C.S. Eng., L.R.C.P. Lond., member of the resident staff, and daughter of the later Joseph Wood, Bradford, Yorks.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

[1] Repeated Doses. Written and illustrated by Joyce Dennys. London: John Lane, the Bodley Head, Ltd., 1931. Pp. 157. 5s.